VOL. XLV. No. 7 JULY 1960

MECCANO MAGAZINE

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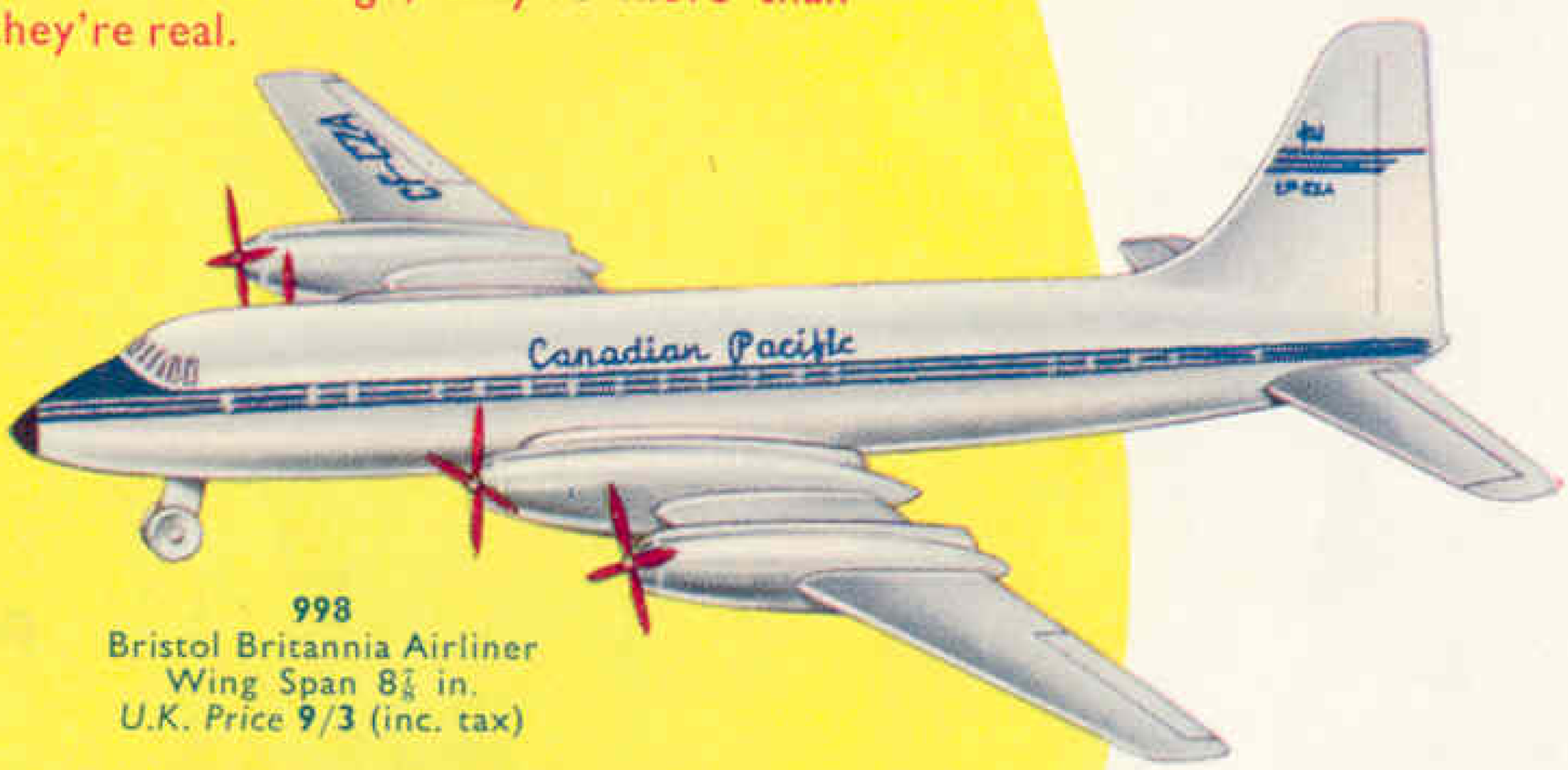

998
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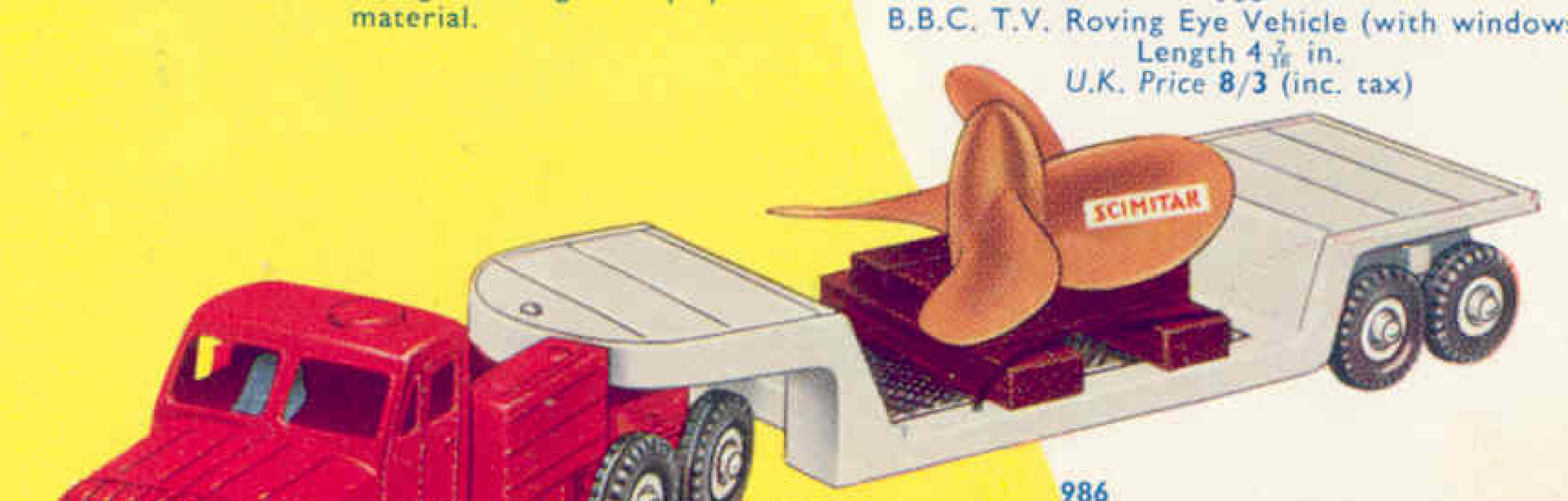

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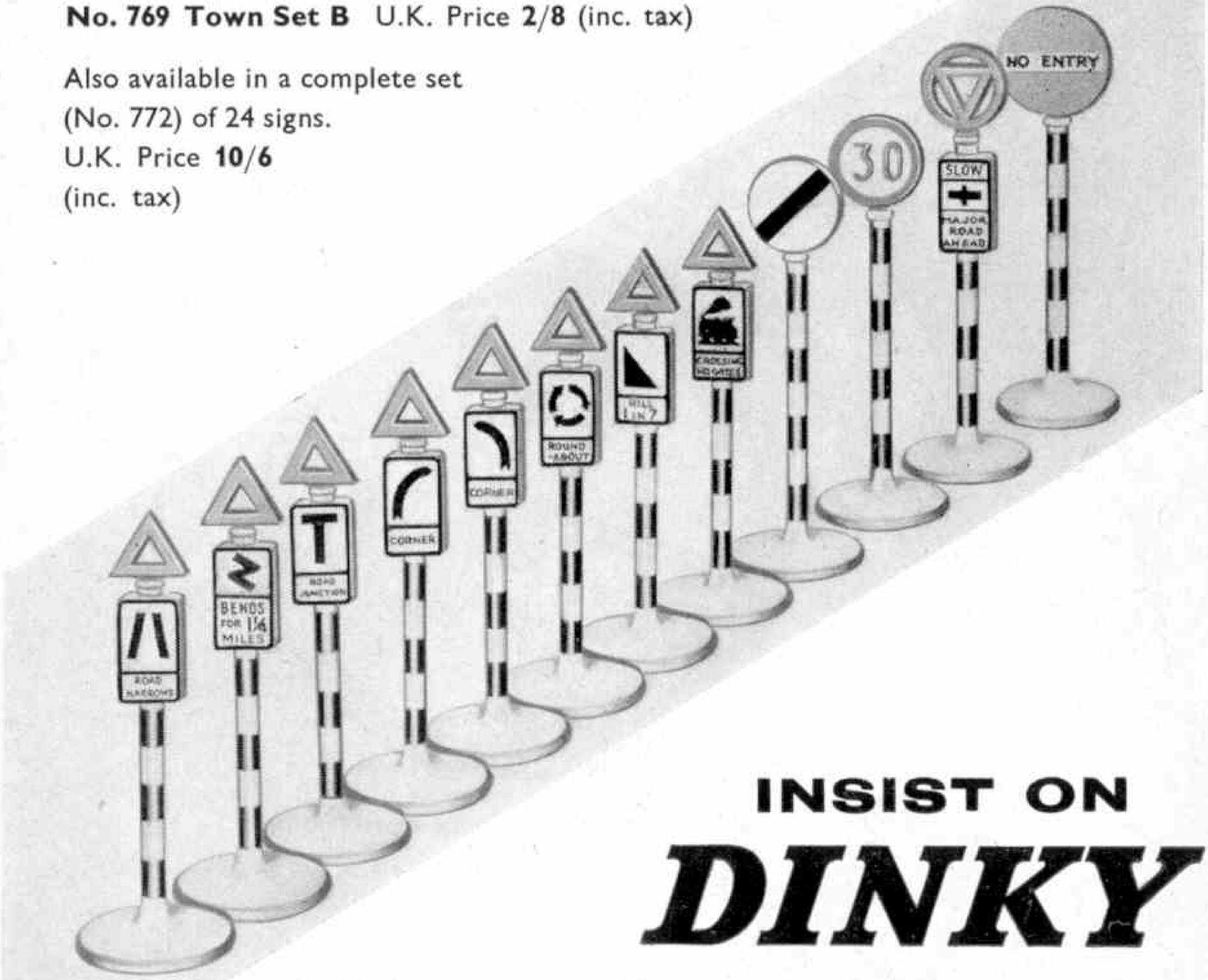

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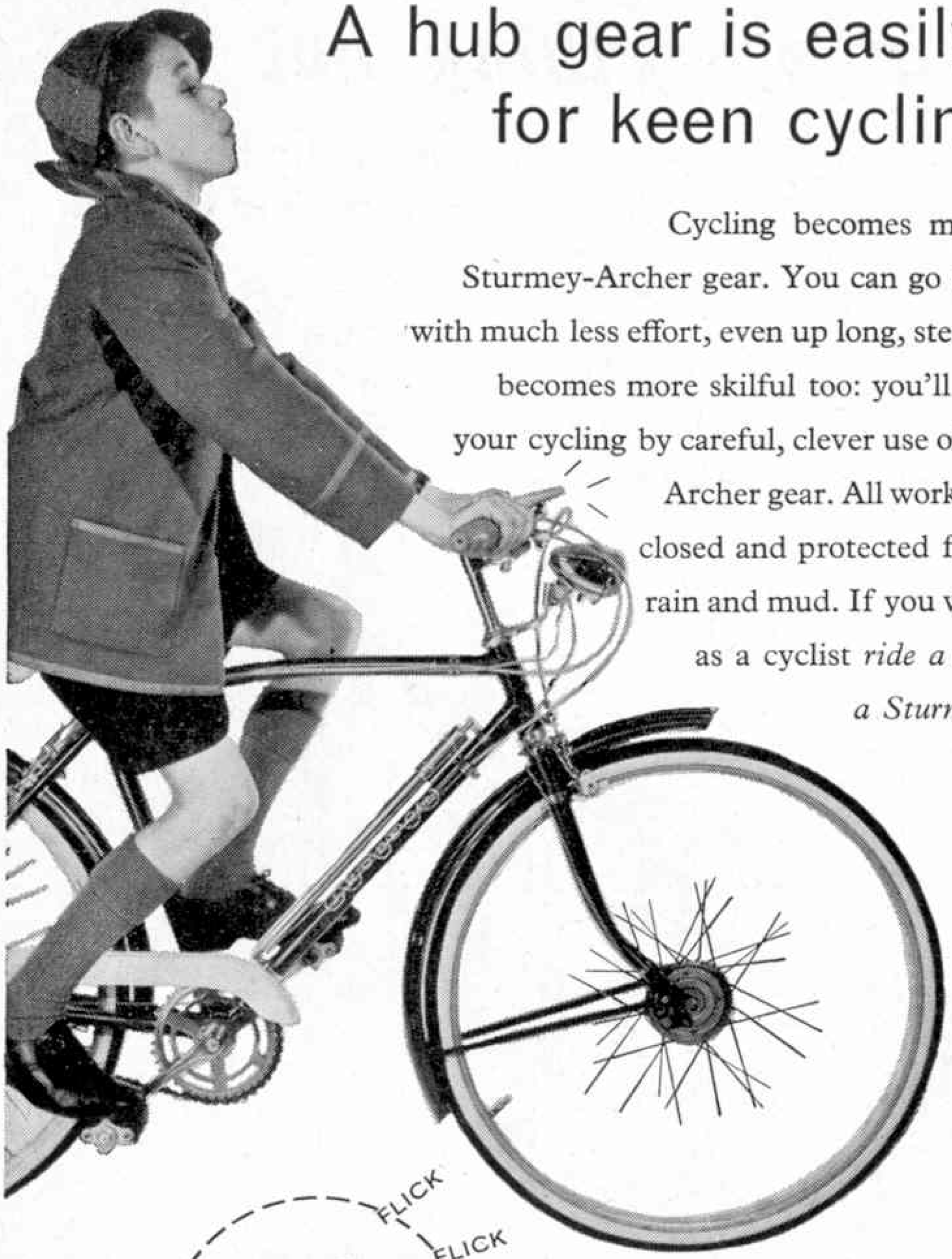

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SA/62

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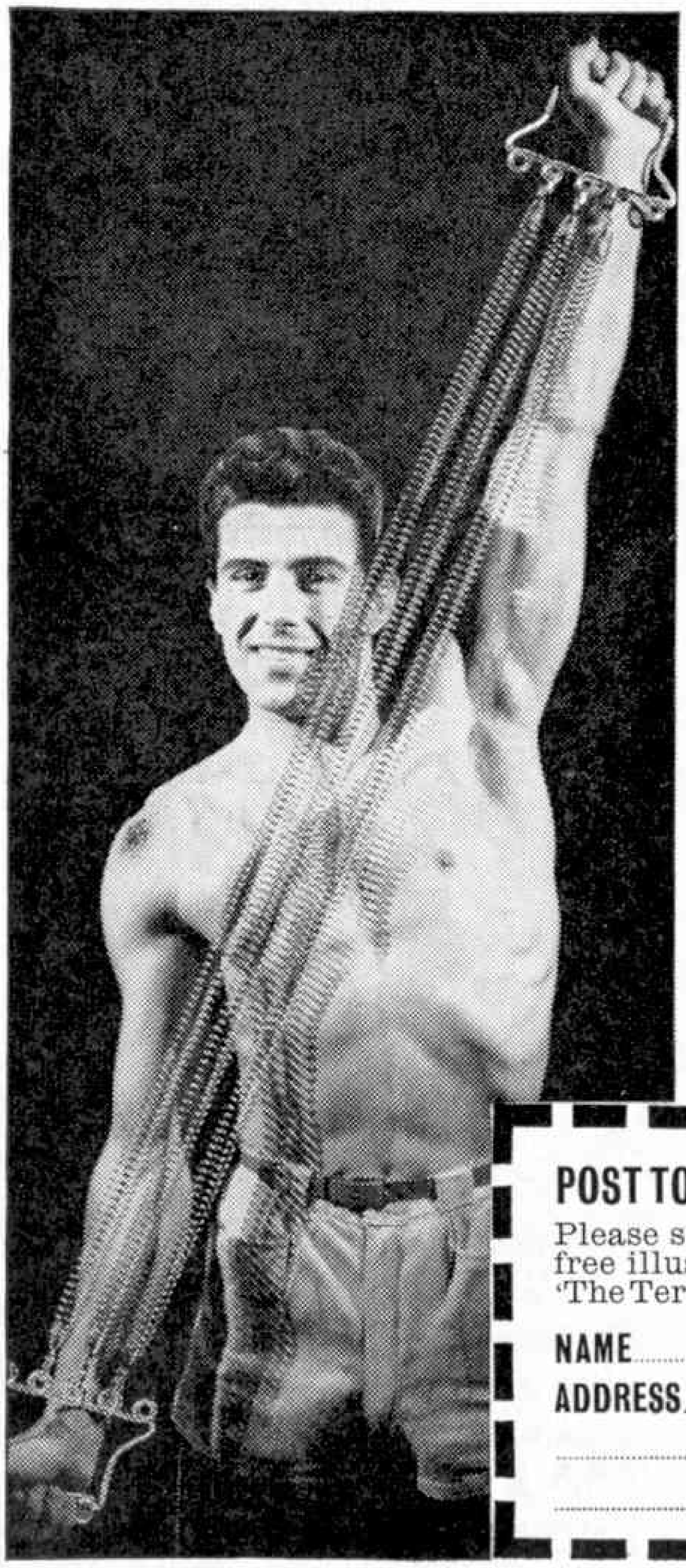

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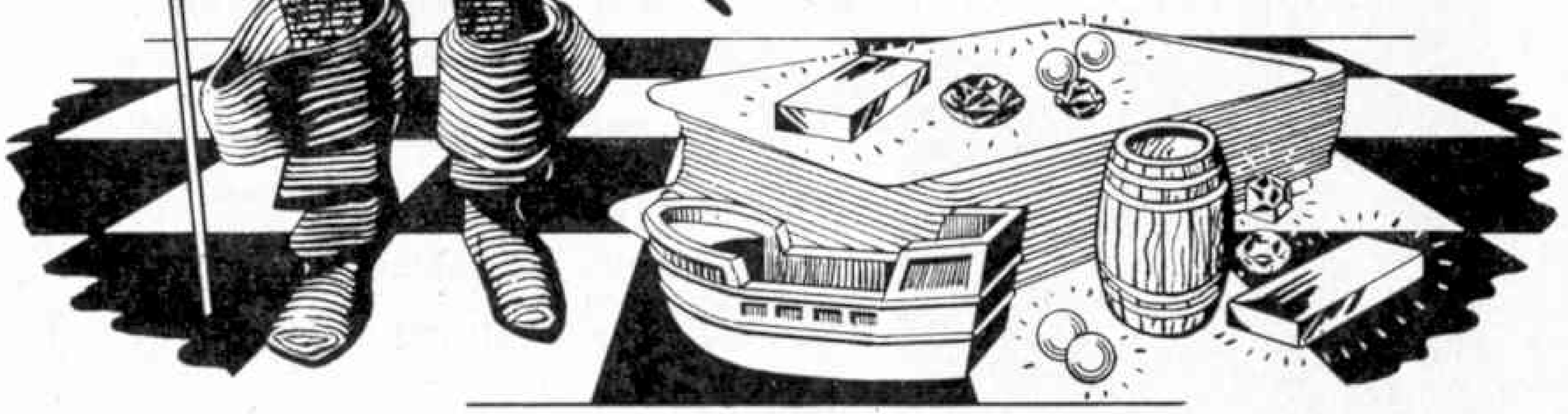

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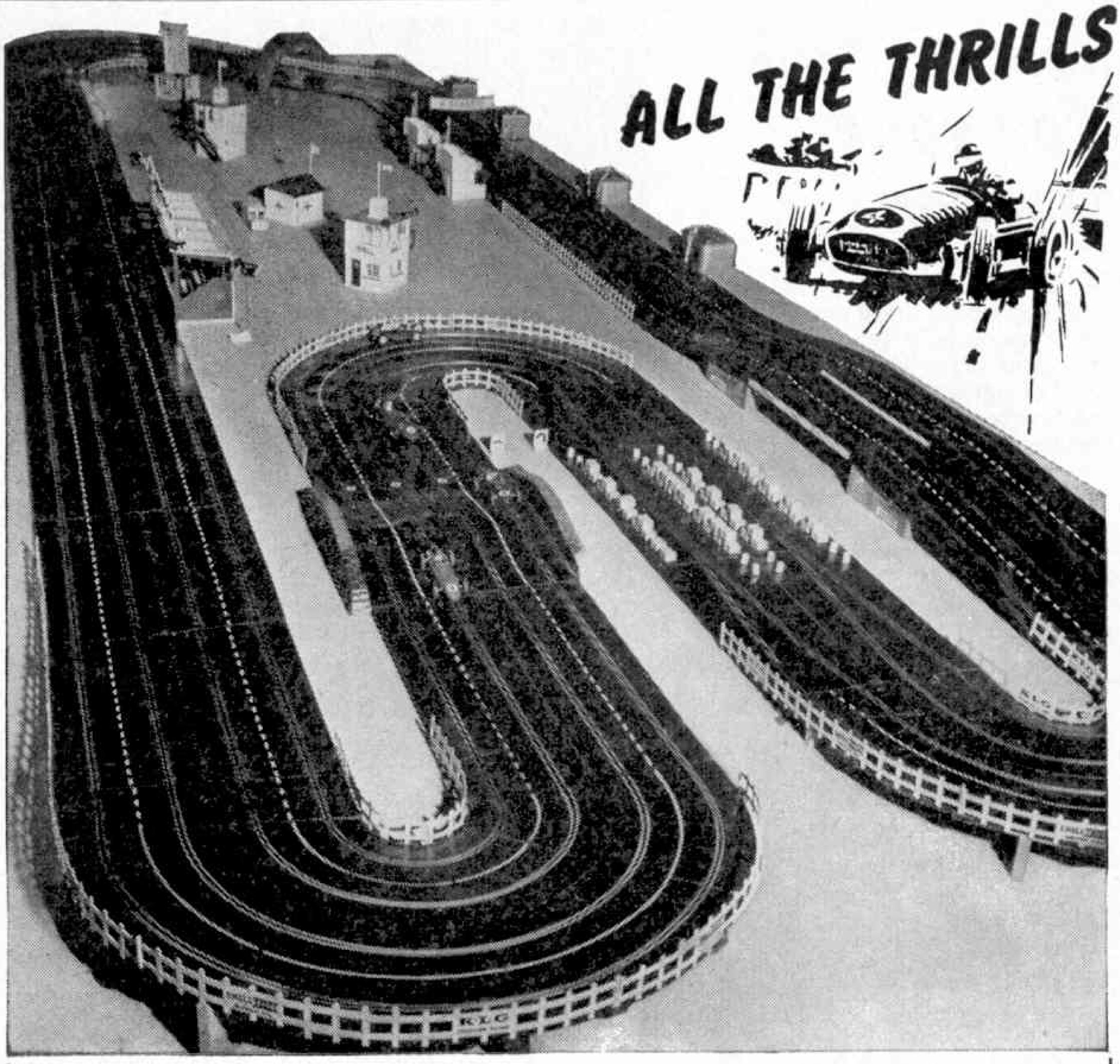

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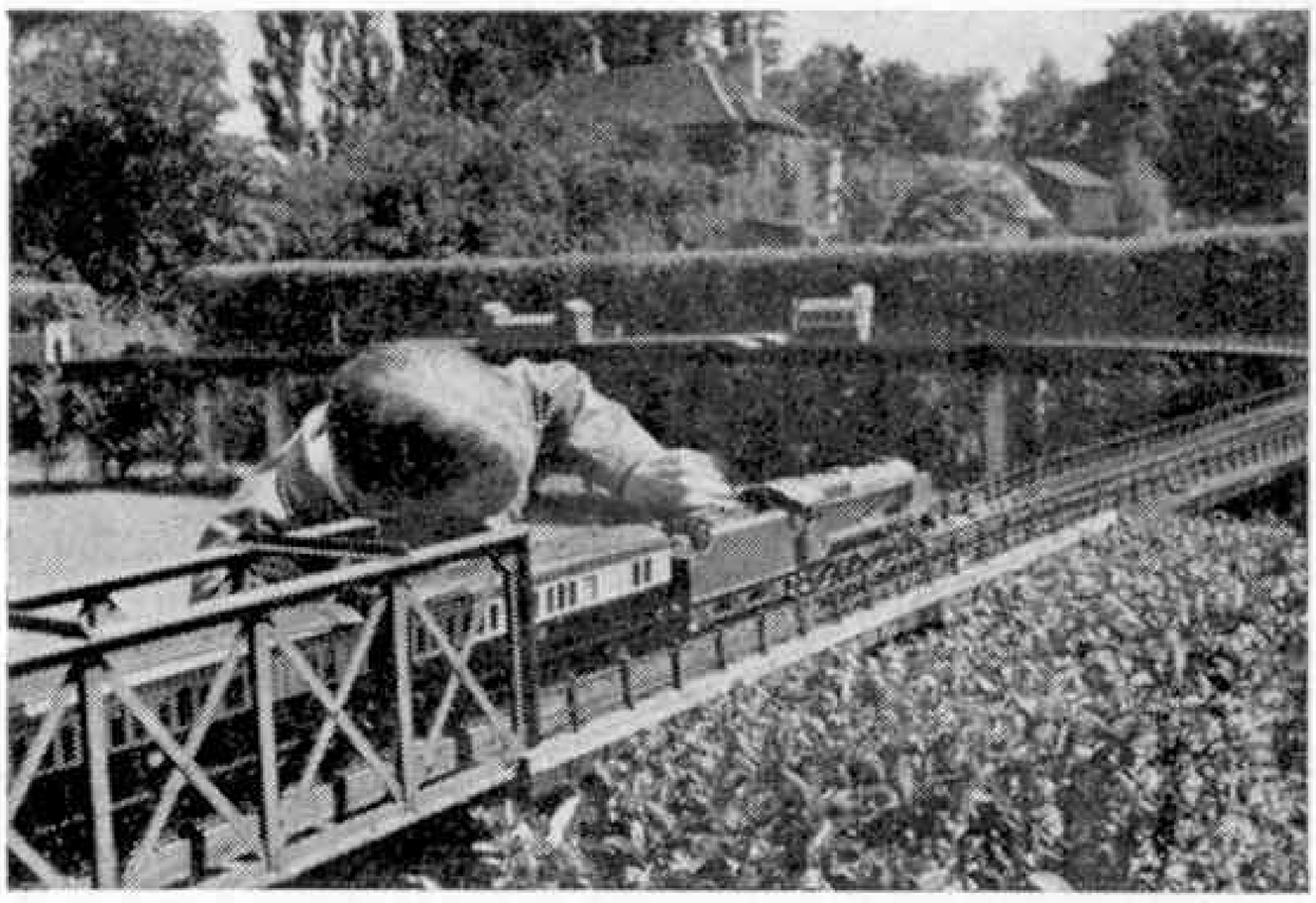

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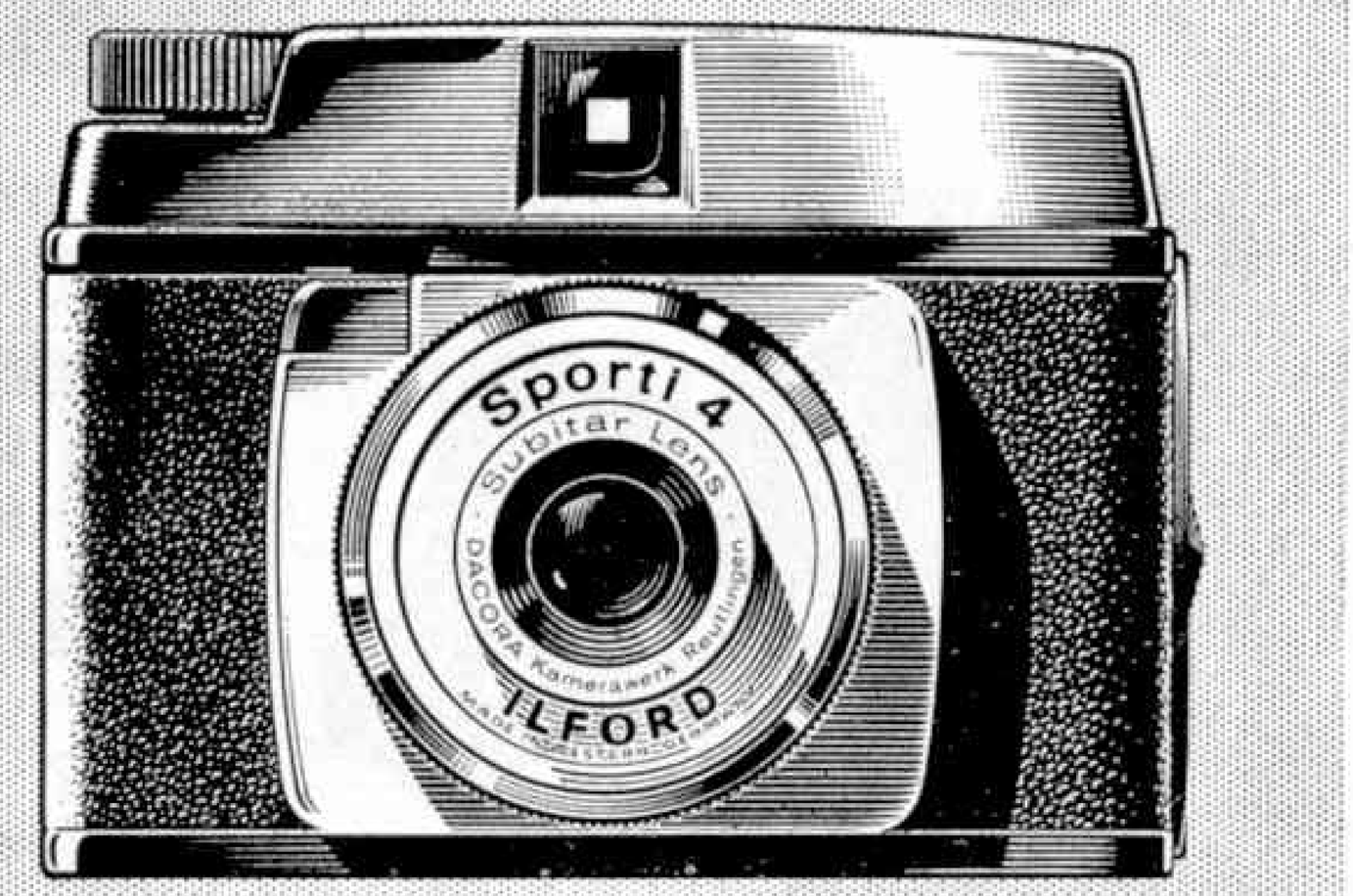

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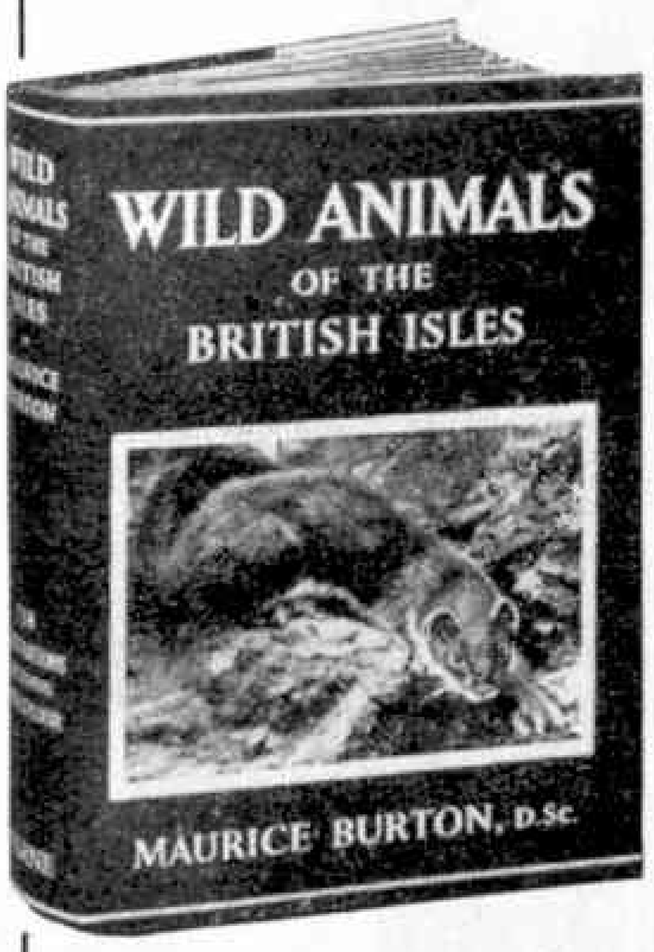

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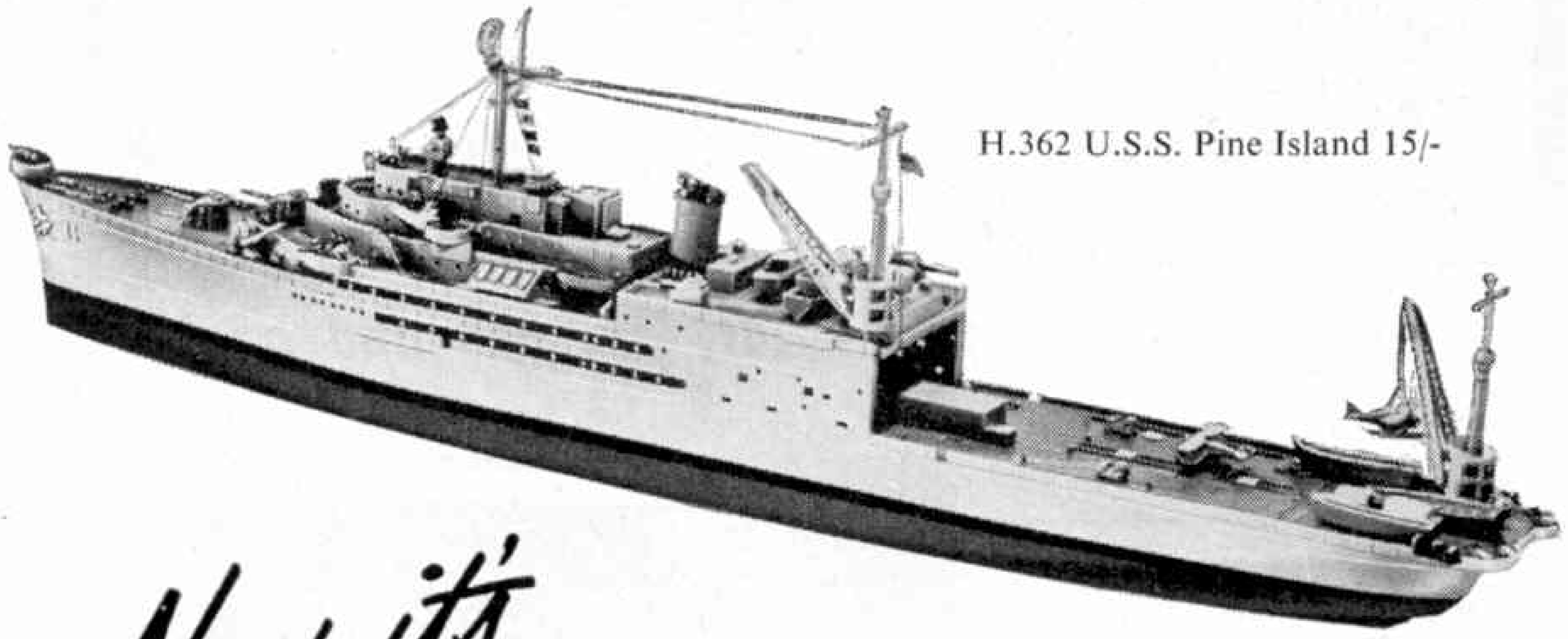

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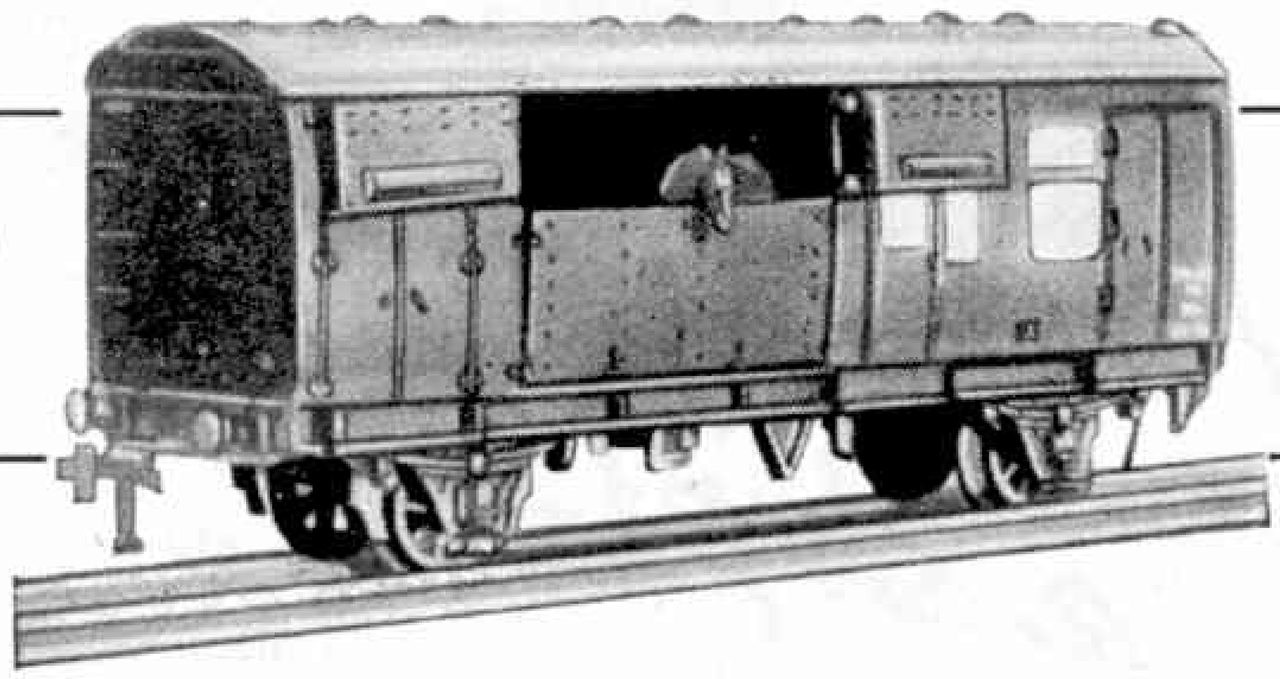

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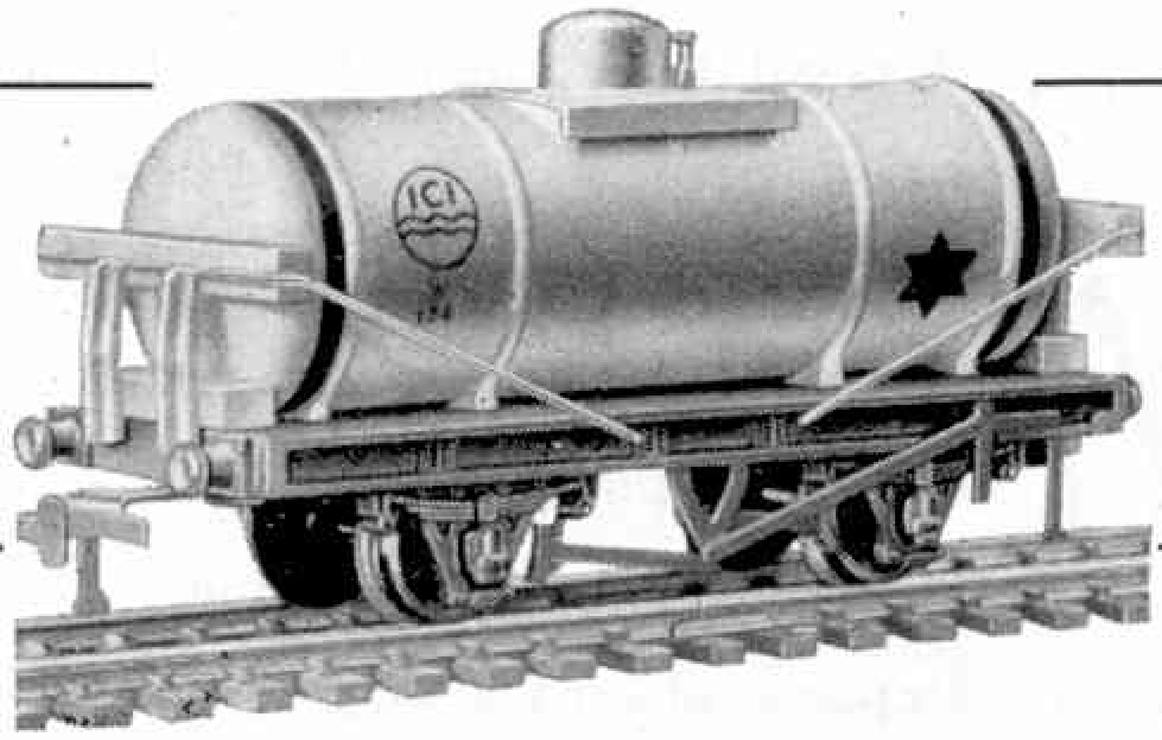

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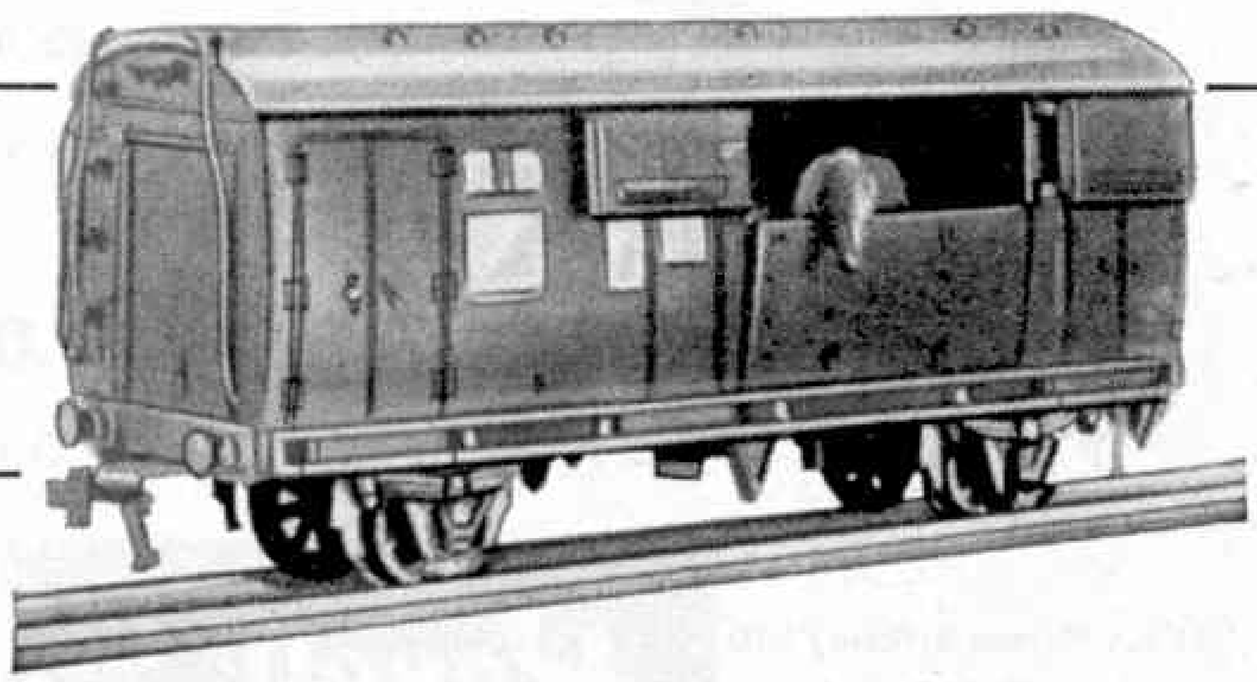

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Editorial Office:
Binns Road
Liverpool 13
England

EDITOR: GEOFFREY BYROM
ASST. EDITOR: ERNEST MILLER

Vol. XLV
No. 7
July 1960

Hornby-Dublo Three-Rail: An Assurance

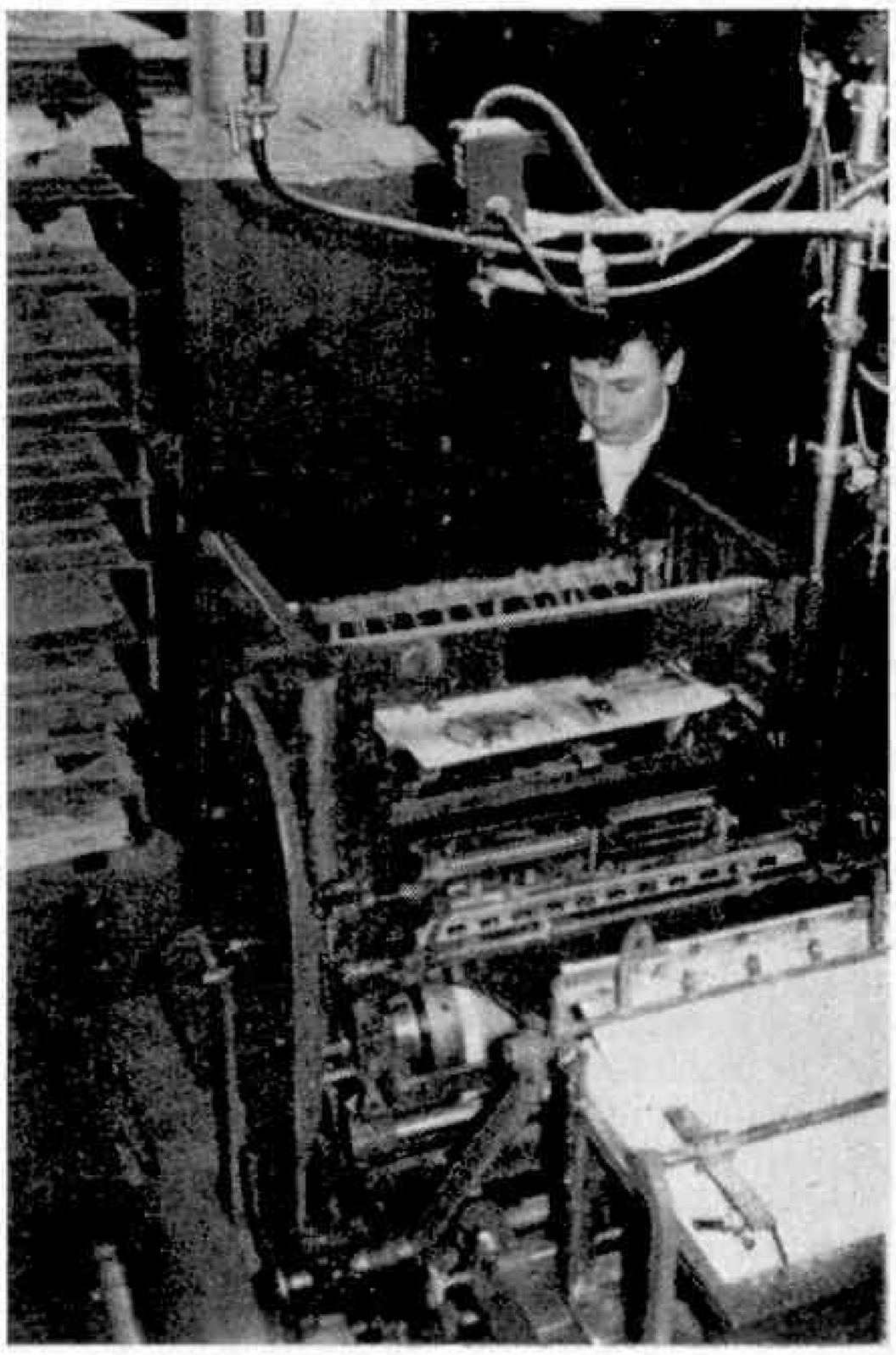
SINCE the advent of Hornby-Dublo Two-Rail Electric Trains, the Information Staff at Meccano headquarters have received a stream of letters asking about the future of Three-Rail equipment. These letters have been answered and the inquiries of the people concerned have been dealt with, or are in process of being dealt with, but I felt I should take this opportunity, in the *Meccano Magazine* itself, of disabusing the minds of our readers that the Hornby-Dublo Two-Rail system is, in the near future, to supersede Hornby-Dublo Three-Rail Electric Trains completely.

I want to make it clear to the thousands of Hornby-Dublo enthusiasts all over Great Britain and in countries abroad that there is no intention whatever of discarding Three-Rail in the foreseeable future. Indeed, there will be no attempt to cease Three-Rail production as long as the demand lasts, and that assurance I wish to give to all who have had any worries on this score.

Now, may I turn to another subject of immediate interest—the questionnaire in last month's issue. I have been delighted at the number of replies received so far; they have been pouring into the office every day, and sifting them is going to be a long and far from easy task. But I am sure the result of it all will be well worth while, and I want to thank all who have taken the trouble to complete the form and return it to this office. If for any reason you have not yet been able to complete your questionnaire, there is still time for you to post it to this office.

I think, perhaps, I should add this—so far, the bulk of the replies have been from our younger readers and I confess to being a little disappointed that the older generation (and there must be many, many readers over 21) have not responded in the same degree. Still, I am ever the optimist, and I wait hopefully for more completed questionnaires from the "Boys of the old brigade".

THE EDITOR.



Charles Boyes, a reader of the "Meccano Magazine" since he was 11, is here seen at work on one of the printing machines at John Waddington Ltd., Leeds, the printers of the "M.M."

Easing the Hazards of the Seaway

By A. C. Davis

A Third Officer aboard a tanker in the Gulf takes an azimuth bearing. This and other photographs illustrating this article are reproduced by courtesy of "The Shell Magazine".

● *Underwater exploration in search of oil, in the Persian Gulf, is the subject of our front cover this month. Our photograph shows a remote-controlled gravity meter—used for taking measurements of slight variations in the force of gravity on the sea bed—being lowered from the stern of the launch 'Shellex III' in the waters of the Persian Gulf. The accompanying article describes the quest for new oil reserves in marine concessions off the Qatar Peninsula, and the part which electronic equipment plays in controlling and assisting navigation in the area.*

IN recent years the Persian Gulf has become one of the most congested shipping centres in the world. Now, the Gulf Lighting Service, which keeps a vigilant eye on navigational aids in those waters, has installed two Decca Navigator Chains which have opened up a new era of safer navigation. In addition, they provide an essential facility for marine exploration.

The Gulf Lighting Service is for ever aware of the dangers encountered in the narrow fairways. Some 10,000 ocean-going vessels navigate these waters each year, including heavily-laden tankers that are annually responsible for moving approximately 140 million tons of oil. A quarter of this total is moved by tankers operated by the Shell Group alone. Greater demands are being made on the masters of these tankers who, with the increasing numbers of larger and faster vessels afloat, find that navigation in congested sea lanes is becoming more hazardous. In murky weather, frequently caused by dust storms, the risk of collision is ever present.

At the same time, the quest for new oil reserves makes it necessary for exploration to be carried out in remote and barren areas, including offshore concessions, where the sea bed is often poorly charted, making it difficult for the surveyor and the seismologist to operate with the high degree of accuracy essential to paving the way to successful drilling operations.

This was the problem facing the technicians of the Shell Group when planning the operations in the marine concessions off the Qatar Peninsula. Navigation plays a crucial part in all the exploration and the transport phases of the oil industry, and some of the problems of both, although slightly different in nature, have largely been overcome by the use of modern electronic aids.

Since 1492, when Columbus discovered America, mariners have attained a relatively high standard of accuracy in navigation based on the "four L's"—lead, log, latitude and lookout. For the past 400 years these four precepts, combined with the use of the compass, have been the cardinal points of sound navigation.

New Equipment's Value

Each of these principles has gradually been improved on and modern devices are gradually supplementing old-established practices. Even the lookout is, in ocean-going ships, assisted substantially by radar equipment which acts as an anti-collision

device as well as an aid to navigation. In spite of its apparent infallibility, this equipment has, however, its limitations in certain adverse conditions, such as heavy weather, rain and sand storms. Particularly in an area such as the Gulf, which abounds in low islands and reefs, little or no help as to the position of the vessel can be given. This is where the new electronic equipment shows its value. The Shell Group was quick to recognise its great potential; in fact, Shell Tankers Limited was the first shipping company in the world to install electronic equipment in all its modern ocean-going vessels. The Decca system was chosen as it was considered the most advanced and versatile equipment on the market.

(Above). On the shores of the Persian Gulf—Doha harbour, which is used by pearl divers and fishermen.
(Below). The captain of one of the small craft follows the course with the aid of the Decca track spotter.

Under the terms of the concession agreement with His Highness the Ruler of Qatar, Shell was obliged to start drilling a well within a fixed time limit. This meant that the seismic and gravity parties had only a set period in which to complete their work to enable the group's technicians to study the survey results and decide on the most promising drilling locations. There was virtually no time available to go back and do a job again if results were not up to standard.

The small craft engaged on this survey often had to operate out of sight of land, without fixes to establish their position, at the same time maintaining absolute accuracy in their navigation under adverse weather conditions. During some months the weather was so rough it was only possible to spend 48 hours at sea. This meant that when conditions permitted, the work had to be hastened. This feat was only made possible by using a temporary Decca Chain, which was dismantled after the survey had been completed. Now the permanent installation being put in by the Persian Gulf Lighting Service can be made available to all petroleum companies operating in the gulf.

The Decca Navigator System was invented by an American, Mr. W. O'Brien, and developed by British technicians. Its first practical application was by the Royal Navy during the Normandy landings. A Shell tanker captain of the R.N.R. was in command of one of the escort destroyers engaged in this operation, which consisted of laying buoys under the cover of darkness at regular intervals and at a given signal. When daylight came, the long line of buoys stretching over the horizon provided a guide to the landing craft which disgorged their troops within fifteen yards of their allocated positions.

(*Continued on page 333*)

With the R.A.A.F. in Malaya

Jungle Air Base

By John W. R. Taylor

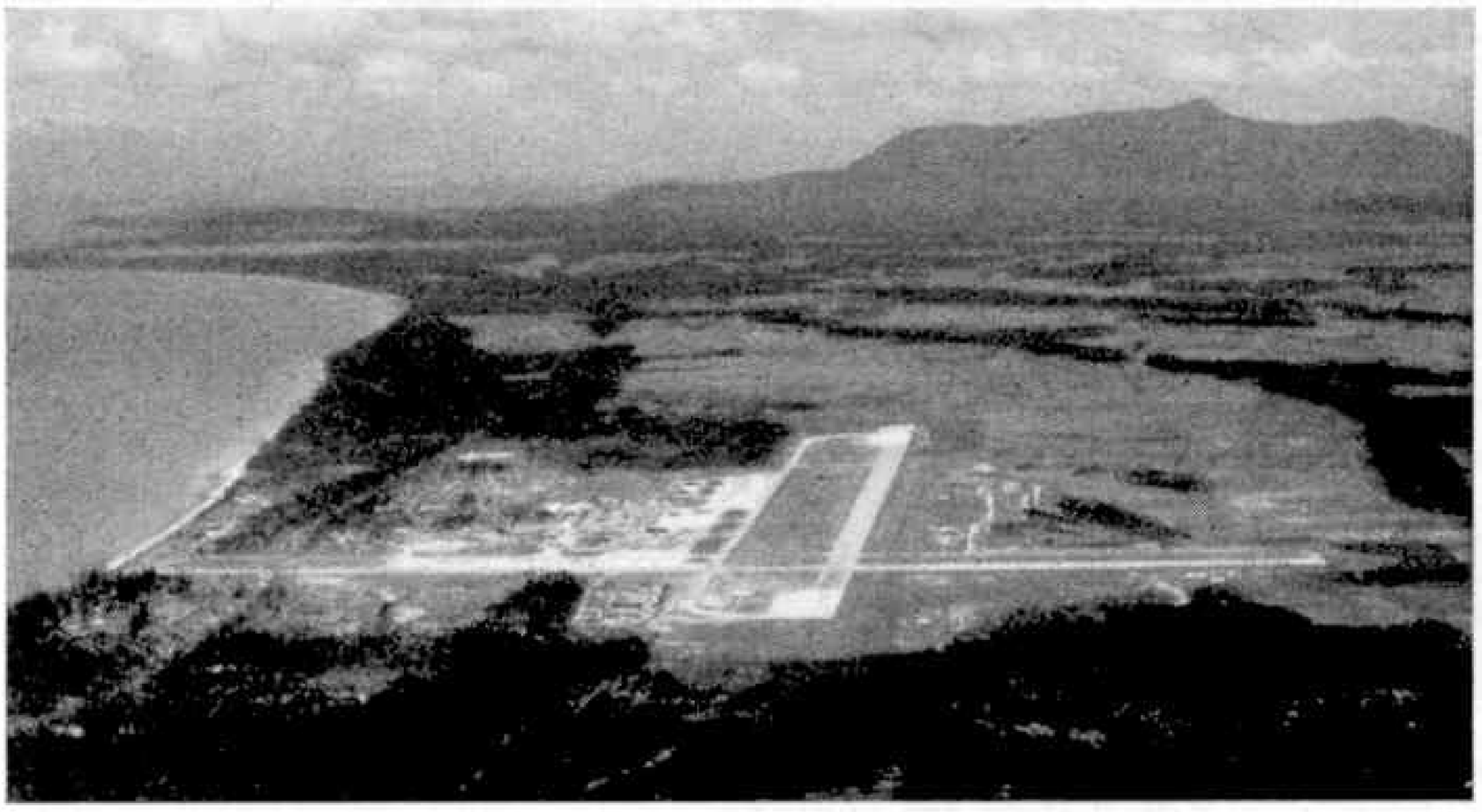
A FEW months ago a team of four Royal Australian Air Force pilots performed aerobatics in their Avon-Sabre fighters during a flying display at Manila, in the Philippines. The crowd of Filipinos became so excited that they afterwards dashed on to the airfield to thank the pilots personally. Even jets of water from fire-hoses, armed soldiers and police on motor-cycles failed to hold them back. Yet the airmen were not full-time specialists in aerobatics, but ordinary squadron pilots from No. 78 Wing, based more than 1,500 miles away at Butterworth, Malaya.

Their main job is to help keep the peace in one of the most troubled areas in the world, and Butterworth is ideally placed for this. Carved from the jungle in the north-west corner of Malaya, it gives air command of the important Kra Isthmus and is 400 miles nearer to areas from which an enemy might strike than is the other major air base of Tengah, Singapore.

Back in December, 1941, it was one of the airfields from which R.A.F. Blenheim bombers took off in a vain attempt to stem the Japanese invasion. Heavy attacks by enemy aircraft reduced the two squadrons to a single machine; but they still refused to give in. Flight-Lieutenant A. S. K. Scarf took off alone to raid the Japanese held airfield of Singora in Thailand, with a gallantry that earned him the Victoria Cross but cost him his life.

The Japs captured Butterworth and improved it for use by their own air force. When that war ended another began, and warplanes roared off the two crumbling bitumen runways to harass terrorists hiding in the dense jungles of Northern Malaya.

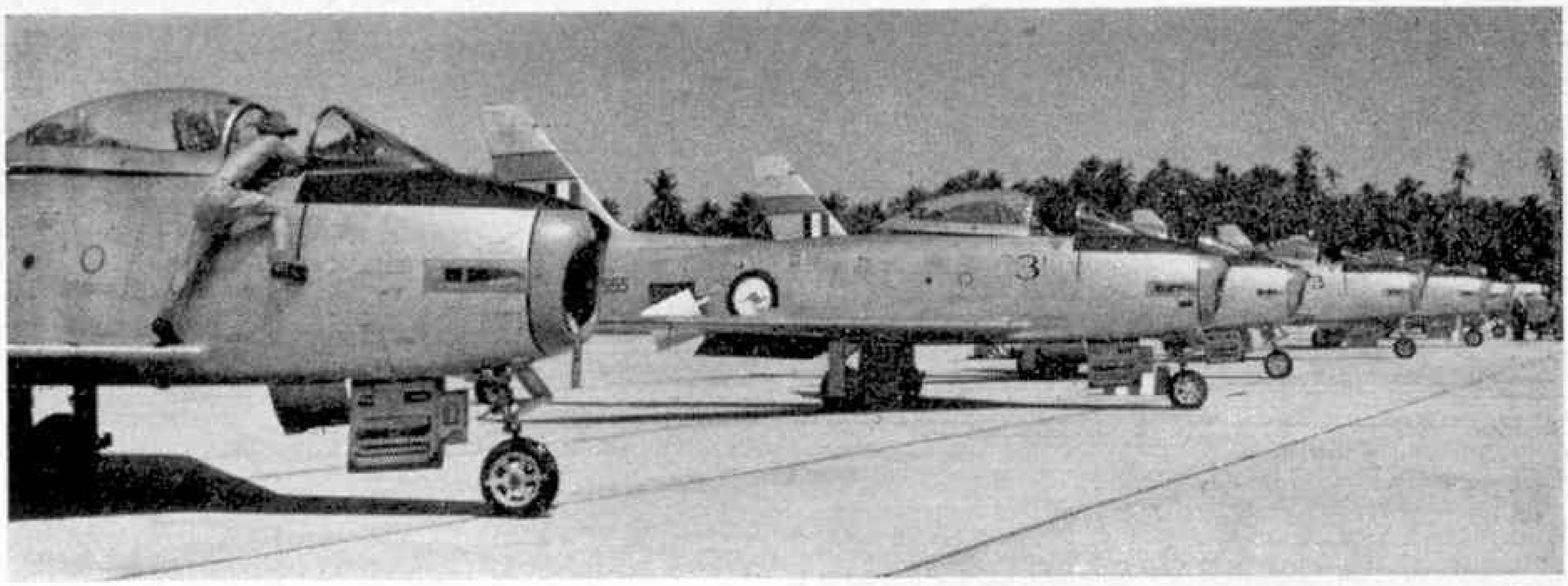
Thanks to the courage and sacrifice of Commonwealth soldiers on the ground and airmen in the skies above, this campaign has also ended. It would be wonderful if all threats of further violence in the area had ended with it. Unfortunately, this is not so and Butterworth is today a key forward defence post of the SEATO (South-East Asia Treaty Organisation) forces, forming part of what is known as the British Commonwealth Strategic Reserve, South-East Asia.



Aerial view of the big R.A.A.F. jet-fighter and bomber base at Butterworth, North Malaya, looking northwards to the 3,205 ft.-high Kedah peak and the Thailand border. The illustrations to this article are from R.A.A.F. official photographs.

SEATO's aim is to keep the peace by maintaining a well-trained defence against attack, backed up by a bombing force of such power that nations will think twice before starting even a minor war. Thus, the aircraft at Butterworth consist of two squadrons of Avon-Sabre fighters and one squadron of Canberra bombers, all built in Australia and provided by the R.A.A.F., plus Dakota transports and helicopters from No. 110 Squadron of the R.A.F.

Before the high-performance jets could be based there, the aerodrome had to be almost entirely rebuilt. The job was done by



Line-up of Australian-built Avon-Sabre jet-fighters of the R.A.A.F. at the coconut palm-ringed base at Butterworth.

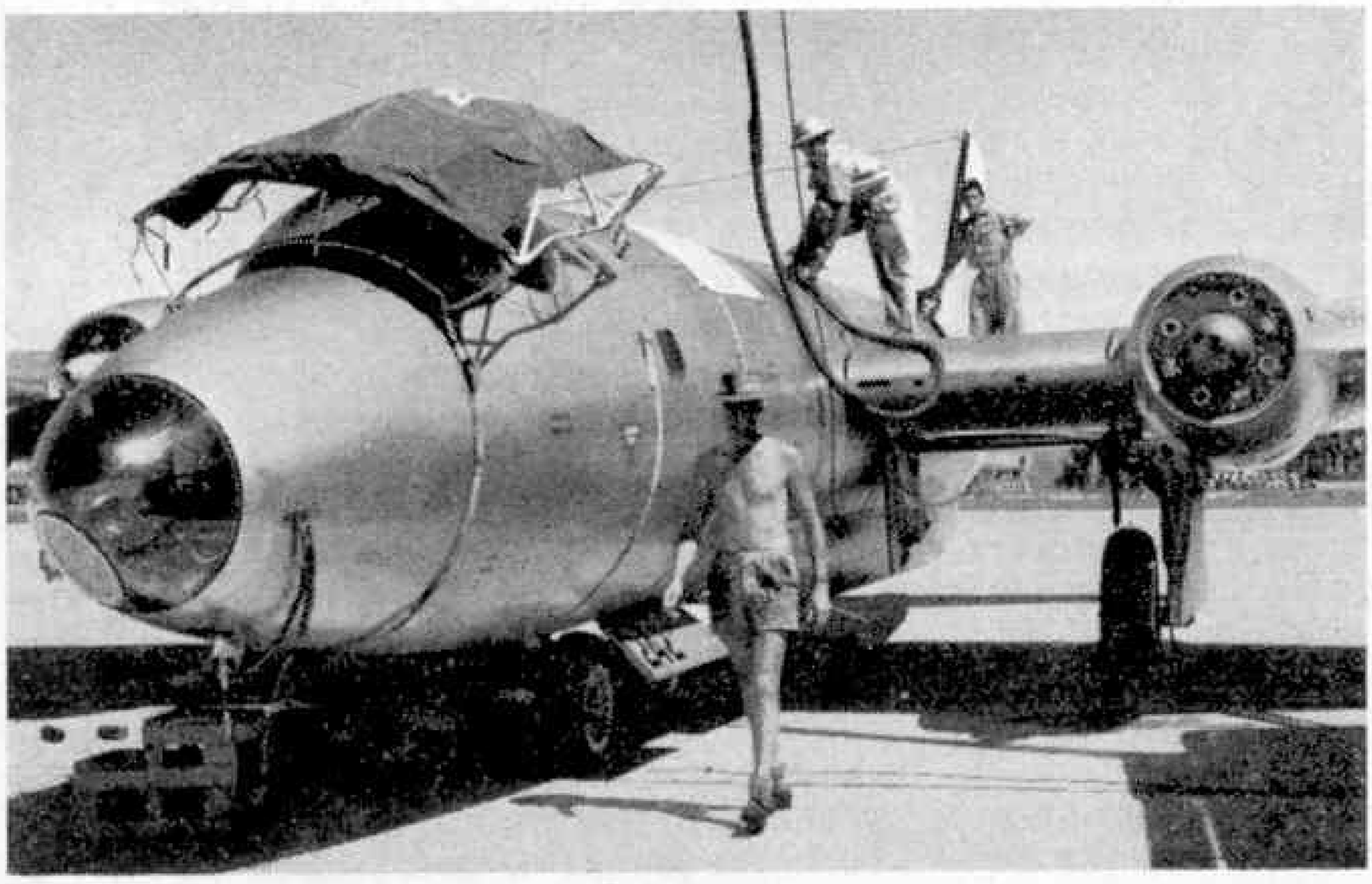
the R.A.A.F.'s No. 2 Airfield Construction Squadron whose personnel, some five years ago, were confronted with the task of moving 400,000 cubic yards of rock—a mass the size of the Empire State Building in New York—for runway materials without interfering with the operation of fighters and bombers from the airfield.

Working seventeen hours a day, in two shifts, the Australians soon got things moving. A 100-ton roller was run repeatedly over every square foot of the lightly-built Japanese north-south runway to test its strength as a foundation for a new runway and to compress the weak spots. Then followed the job of extending it to a length of 8,000 feet, with 500-ft. stretches of concrete at each end to withstand the searing jet exhausts of aircraft beginning their take-off run.

The job was made more difficult by the fact that the site for one end of the new runway was a swamp, and by the rain which falls almost every day in this corner of Malaya. There is an official wet season, but this can be distinguished only because it then rains in the morning, as well as in the late afternoon.

Every kind of modern equipment was used to speed the work. Giant bulldozers went in first, nosing into the jungle and pushing over 100 ft.-high palm trees with a single shove. Engineers with pumps and mechanical shovels gulped away the swamp until they reached solid ground, then filled the immense hole with thousands of tons of sand and crushed rock.

The rock was quarried from a hill ten miles away, and if the hill had a name you won't find it on the map now because the hill is not there any longer. Some of it was carried by huge transporters, able to haul fifteen tons at a time. In contrast, an army of Malay, Indian and Chinese labourers was also employed, each carrying a few pounds of rock in a wicker basket balanced on the head.

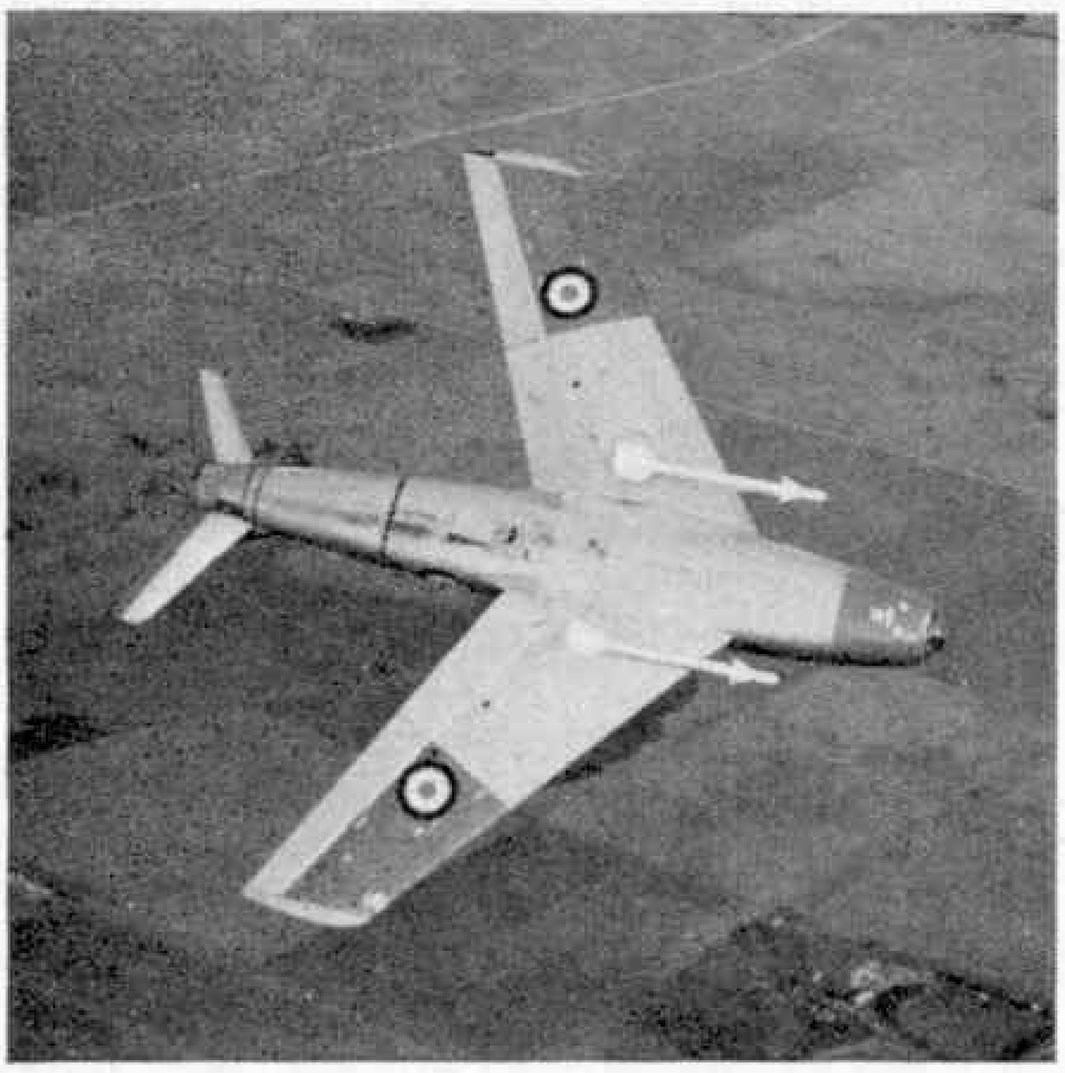


A Canberra jet-bomber of No. 2 Bomber Squadron, R.A.A.F., being refuelled at Butterworth.

As a result of these combined efforts, Butterworth now has one of the best operational runways in South-East Asia, and fine new hangars, buildings, taxiways and parking stands. More than 1,000 airmen work there. Many are from the R.A.F.;

but the base is commanded entirely by the R.A.A.F., and Aussies in their familiar felt slouch hats make the base seem almost like a corner of Australia until the visitor glimpses the green jungle all round, and the lofty 3,205 ft. Kedah peak to the north.

Butterworth never sleeps. Early each morning the whine of jet-engines is heard as the Avon-Sabres of No. 78 Fighter Wing, made up of Nos. 3 and 77 Squadrons, wind



The first R.A.A.F. Sabre jet-fighter to be equipped with Sidewinder air-to-air guided missiles. They are clearly visible under the wings.

up for the start of the day's flying. A few minutes later the Canberras of No. 2 Bomber Squadron join in, their duty consisting perhaps of bombing practice at the nearby range or a navigation exercise to Bangkok.

The personnel in the control tower are kept busy. Not only have they to cope with the continuous comings and goings of the jets, but they have also to fit in odd Meteors, Bristol Freighters, a helicopter or two, tiny lightplanes belonging to the Australian Army and Lockheed Hercules turboprop transports, hopping direct from Australia with a dismantled Sabre, or several tons of supplies and equipment, in their huge cargo-holds.

In one corner of the airfield, the radar aerials of No. 114 Mobile Control and Reporting Unit search every inch of the sky with eyes that never tire. By day Malayan members of No. 94 Field Squadron, R.A.F., guard the base. At night, it is the turn of Alsatian police dogs to patrol the line-up of aircraft.

Such precautions remind visitors forcibly that the R.A.A.F. is not there for fun or merely to provide aerobatic teams for air displays. There is plenty of fun for the airmen and their families, who are able to enjoy well-organised games of Soccer, Rugby Union football and cricket, and to swim all the year round. But life exists against a background noise of jet-engines.

Typical of the exercises which keep the squadrons on their toes was "Air Progress," in which No. 2's Canberras joined other Canberra squadrons of the R.A.F. and R.N.Z.A.F. as part of a Commonwealth Air Task Force. Operating with complete unity, the three-nation bomber force first played the part of an aggressor, swooping down ahead of ground forces who were presumed to be invading Thailand. After mock battles against defending radar-directed Super Sabres of the U.S.A.F. and Thunderjets of the Royal Thai Air Force, they switched sides for part two of the exercise. This time they gave close support to counter-attacking Thai army units, while the fighters escorted R.A.A.F. Hercules transports carrying assault troops, guns and vehicles to the front line.

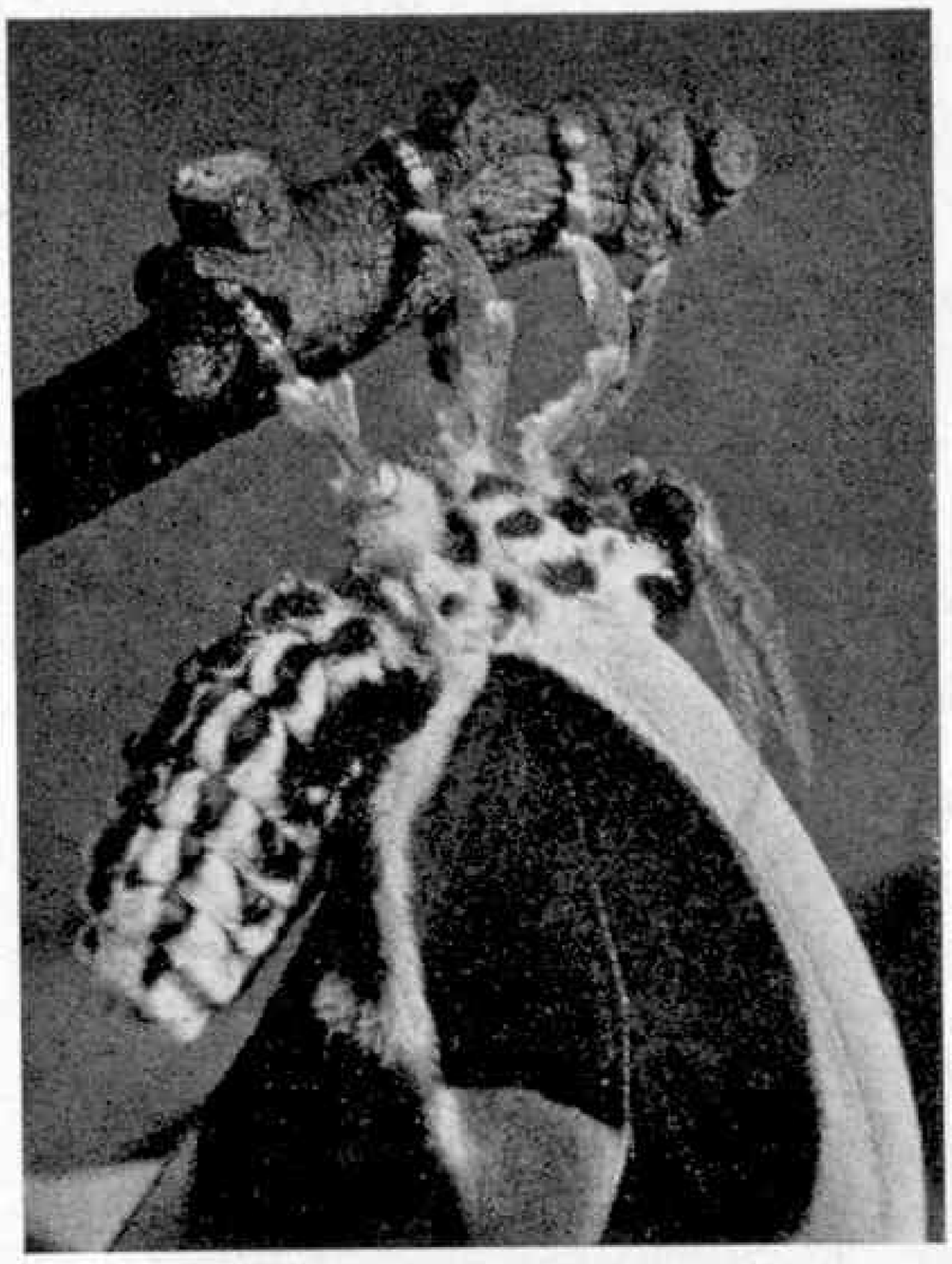
All this was make-believe, but it proved the efficiency of the squadrons taking part. At about the same time the R.A.A.F. Avon-Sabres were equipped to carry the new and deadly Sidewinder air-to-air missile, which homes on to the hot exhaust of an enemy aircraft.

In the first practice shoot with a Sidewinder, Group Captain G. A. Cooper, D.F.C., A.F.C., Commanding Officer, No. 78 Wing, destroyed the target with a single missile. This, too, proved that aircraft flying from the jungle air base of Butterworth are well able to perform the vital task assigned to them.

A New Zealand Diesel Outing

On 30th April last, writes our reader N. D. Gouk, of Matamata, New Zealand, the Auckland Railway Enthusiasts Society (Inc.) ran an excursion to Kinleth, centre of the "N.Z. Forest Products" sawmilling and paper milling activity. The train, appropriately named "*The Pines Express*", consisted of a "Da" diesel-electric locomotive, four coaches and a van, the form the Auckland–Wellington express will take shortly. The quicker acceleration and hill climbing of the "Da" locomotive over the "J" class steam locomotives will reduce the running time to about ten hours, with an average speed of 42 m.p.h.—quite good for the N.Z. narrow gauge. On the excursion, many eyes were opened at the over-50 m.p.h. up the 1 in 100 grades, and even the most ardent steam enthusiasts agreed that it was a most notable performance.

THE WORLD'S Exotic Silk Moths



An Atlas Moth dries and spreads its wings.

By

L. HUGH NEWMAN, F.R.E.S.

IF you look at one of the huge Atlas moths in some natural history museum it is difficult to believe that this beautiful and exotic insect belongs to the same family as the small putty-coloured Chinese Silk Moth which has supplied mankind with pure silk fibre since time immemorial. The silk moth, or silk worm as it is usually called, has been reared so long in captivity that it could now no longer exist without man's care.

The smooth, greyish caterpillars have no natural defence and lack the strength to move more than an inch or two in search of food. Exposed to the elements and their natural enemies, and compelled to crawl from twig to twig in search of mulberry leaves, they would succumb within a few hours and the moths themselves, unable to use their wings in flight, would be equally helpless.

The wild silk moths are very different creatures and our own Emperor Moth, the British representative of this large family, is an active and powerful flier, although it cannot compare in size and beauty with its relations from other parts of the world. The Atlas Moths are famed for their size and the biggest of them, *Attacus Atlas*, measures nearly a foot across the wings.

The moth illustrated above, although similar in colour and markings, is a smaller species known as Edward's Atlas and seldom exceeds eight to ten inches in wing span. The ground colour of its wings is a rich purplish brown and chocolate, decorated with white lines. The outer borders are grey with scallop markings of black and yellow, and all four wings have a more or less crescent-shaped transparent area which lacks scales. You can even read a newspaper through these curious "windows" on their wings.

This magnificent moth is a native of India and the Far East, including the East Indian Islands, but you can rear it in this country, and many people have done so. The caterpillars, which are covered in a waxy white powder, will eat the leaves of privet, pear or plum, and if you keep them in a warm, moist atmosphere, such as in a greenhouse, they will grow very rapidly. Fully grown they are pale apple green, dusted with white powder and have rather long, fleshy backward sloping tubercles on each segment, which gives them a very strange appearance. They measure about four inches in length and weigh nearly an ounce.

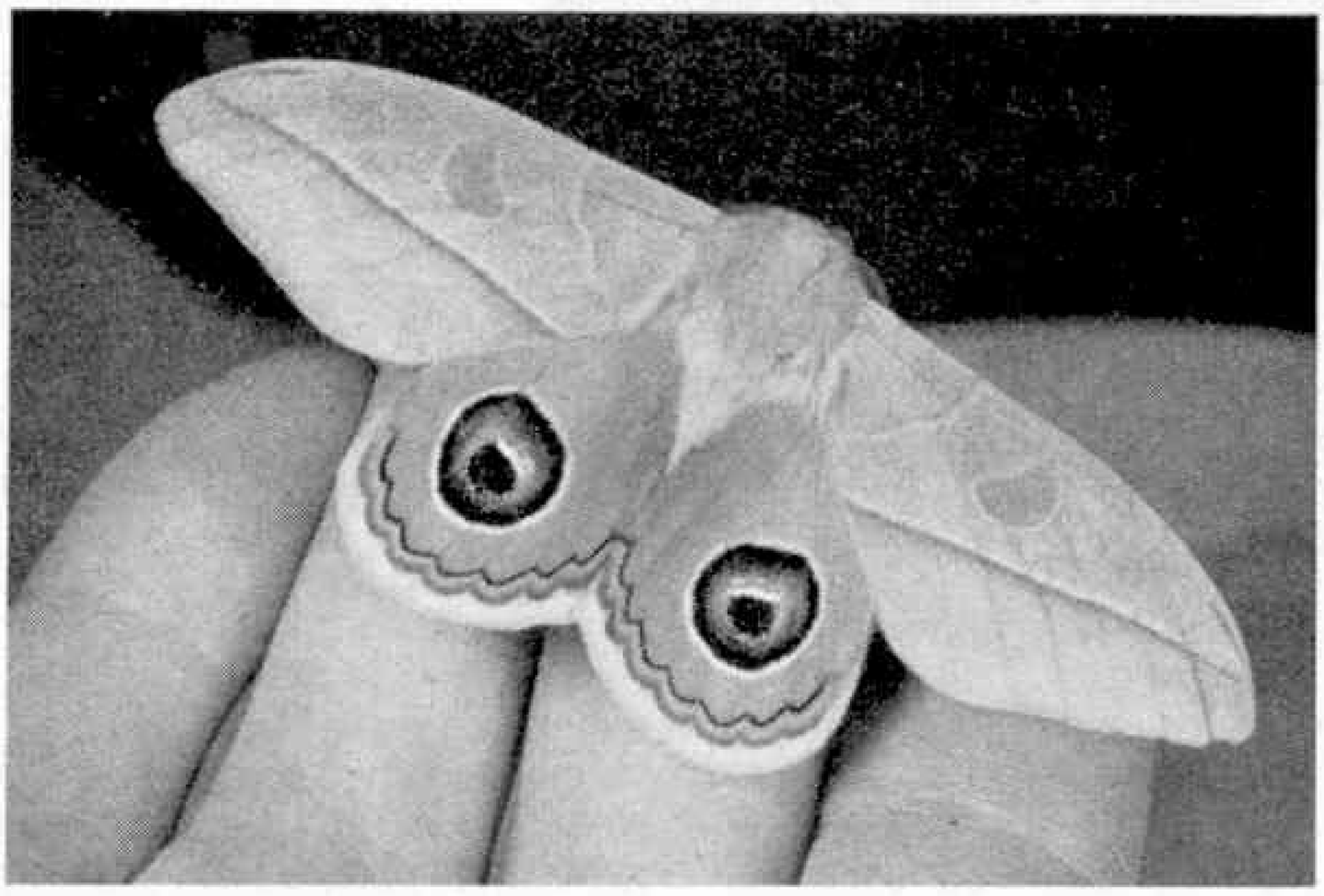
Like most of the silk moths, the Atlas spins a substantial cocoon of light fawn silk and usually incorporates leaves and twigs in the structure. When finished, it is very solid and firm to handle. Cocoons are imported into this country from India, and in order to get the moths to emerge without crippling their wings it is important to spray the cocoons with warm water and keep them in a warm humid atmosphere when the time for emerging approaches. The insect in the photograph has just emerged and is hanging up on a twig, drying and stretching its wings.

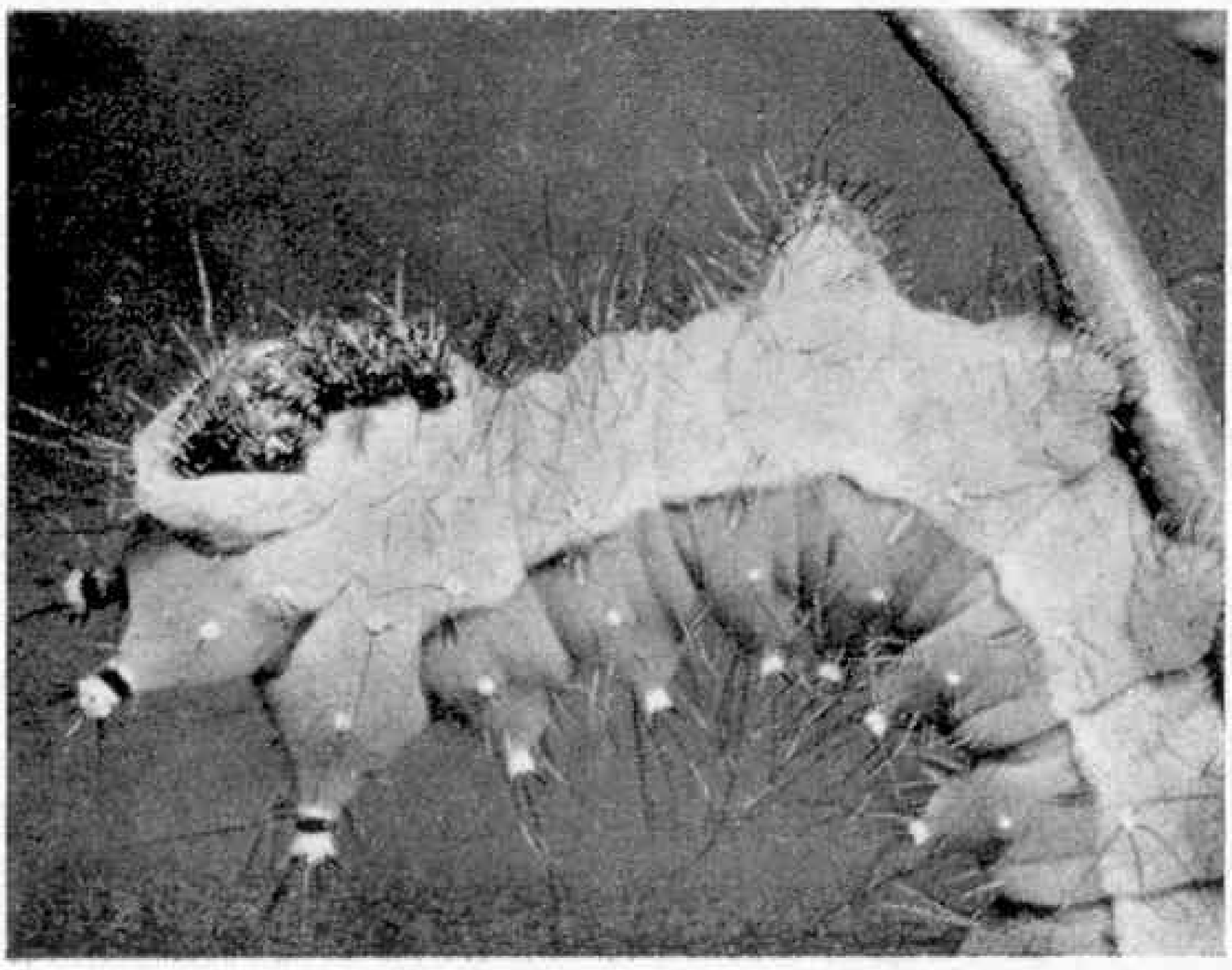
The Bull's Eye Moths are much smaller

insects and very different to look at. There are many species and all come from the other side of the Atlantic where they range from Southern Canada to Brazil and the Argentine. They vary a good deal in colour but can always be recognised by the startling eye spots on the hind wings. When the moths are resting, with the fore-wings folded like a roof over the body, they resemble dead leaves, but as soon as they are handled or disturbed in any way they raise their fore-wings and reveal the brightly coloured "eyes", which are usually indigo blue and are surrounded by a distinct ring which makes them look very much like the eyes of some fairly big animal.

The moth illustrated here is *Automeris Viridescens*, a native of South America. When the moth is alive the male has a beautiful green sheen on the fore-wings. The larvae, which will feed on sycamore, maple and false acacia, start off by being more or less brown in colour but later turn black, decorated with brilliant canary yellow spines. These spines, which are branched and sharp, resemble miniature fir trees in shape and provide a most efficient armour against insect-eating birds. The spines actually contain a mild poison and if you handle the larvae carelessly you will find that they sting, rather like nettles, although less fiercely. The dark brown cocoons are spun among the leaves of the food plant.

The loveliest and most ethereal looking of all the silk moths is the Indian Moon Moth. The wings are a pale and delicate blue-green, shading to pale pink at the tips of the trailing tails. A narrow band of purple runs along the front edge of the fore-wings and each wing carries a circular "moon-like" mark. Delicate shadow markings pattern the wings, and the body is covered in snow-white, silky fur. Released at dusk on a summer's evening, the male moths dart and swoop like house martins and are beautiful to watch.





The Mexican Bulls-Eye Moth (above) is easily recognised by its startling eye spots on the hind wings. (Below): *Actias Selene* (the Indian Moon Moth).

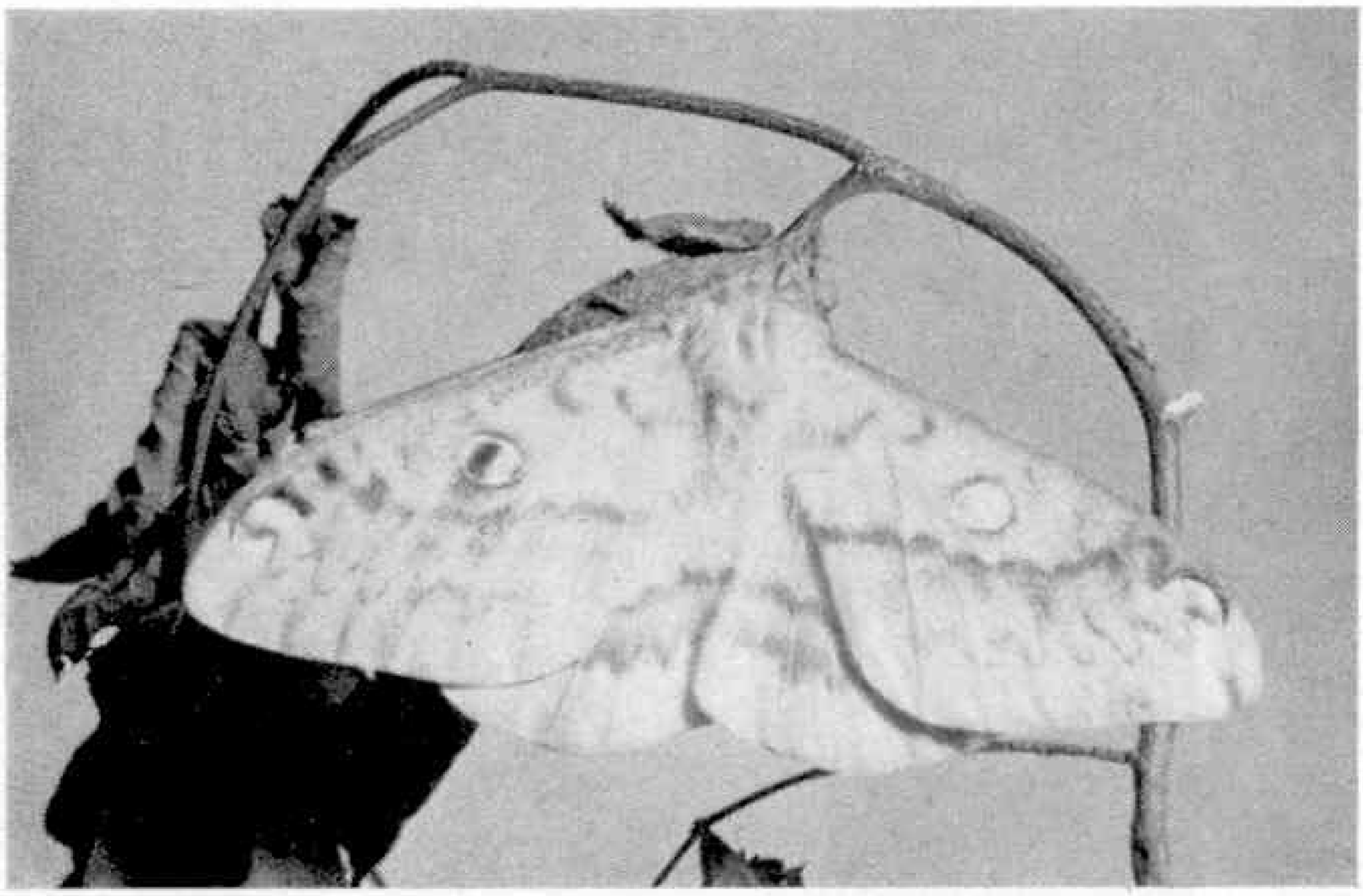
Although they look so fragile and delicate these moths are, in fact, one of the easiest of all the silk moths to breed in captivity in this country and innumerable amateurs have reared them successfully year after year.

The moths, which have been imported in the cocoon stage, usually emerge early in June and will pair in quite small cages. The large, oval, russet brown eggs are usually laid in great numbers and the newly-hatched caterpillars are red, with a black saddle and black head and legs. After the first moult the black saddle disappears and at the following skin change the caterpillars turn bright green with brown head and legs. They are decorated with prominent yellow tubercles crowned by tufts of spines.

Unlike some silk moth caterpillars which are rather slow and sluggish, the moon moth caterpillars are very active, especially in the younger stages. They feed best on plum but will also eat

hawthorn, apple, poplar, and various other leaves, so it is a good idea to supply them with bunches of mixed food. As they grow they consume very large quantities, and hungry moon moth caterpillars will click their jaws in an extraordinary manner, as if to tell you to hurry up and bring some more food!

The rough, light brown cocoons are spun on the twigs and among the leaves of the food plant. A second brood of moths emerges in the early autumn and it is often difficult to rear the larvae of this generation successfully. They will eat rhododendron leaves, however, and provided one can keep them warm it is possible to get them to feed without interruption.



A great favourite in this country is the Japanese Squeaking Silk Moth.

Squeaking Silk Moth

Japan is a wonderful country for insects and many of the Japanese silk moths are both easy and interesting to rear. The Squeaking Silk Moth, *Rhodinia Fugax*, is a great favourite in this country because the caterpillars are so unusual. Eggs imported from Japan hatch in late April or early May and in the first skin the larvae are ringed in black and yellow with black heads. After the first moult the head becomes green, outlined in black, and the body turns a greenish-yellow, decorated with small tubercles, crowned with short black hairs. Immediately behind the head are four blue tubercles, ringed with black at the base.

In the later stages the caterpillar turns green all over and except for two points on the third segment, the tubercles almost disappear. The skin is rather rough and the upper part of the body is lighter in colour than the under surface. The two shades of green are divided from each other by a yellow line with blue dots.

When this stage is reached the caterpillar has also developed its "voice", and if you touch it with your finger or with a twig it squeaks or chirps loudly. The curious thing about this is that even after the caterpillar has spun its cocoon, which looks rather like a small greenish lemon which has been cut off at one end, it will still squeak if it is roughly handled. The caterpillars seem to like sycamore best of all, but will also eat oak or willow.

Dictyoploca Japonica is another Japanese insect which is quite hardy enough to be reared out of doors in a muslin bag tied over its growing food. Horse-chestnut is the best thing to feed these larvae on. They are quite different from *Fugax* and instead of being almost smooth are very furry. At first they are black but later they become pale green, with a row of blue "port-holes" down their sides. A bagful of larvae gives off a delightful smell of chestnut blossoms, although they feed on the leaves, not the flowers.

Open-work Cocoon

This caterpillar spins a cocoon quite different from that of the other silk moths. Instead of being solid it consists of an open-work mesh through which you can easily see the pupa inside. Both these Japanese species emerge in the autumn and after the moths have mated the eggs are laid in clusters. They do not hatch until the following spring and the best way to store them is to keep them in a tin, in a refrigerator, until the beginning of April, otherwise they may hatch before the leaves are out.

SPACE NOTES

ION PROPULSION

By
J. Humphries, B.Sc. (Eng.)
A.M.I.Mech.E., A.F.R.Ae.S

CONVENTIONAL chemical rockets work by expelling hot gases, produced by reacting chemicals together, through a nozzle. The thrust produced is equal to the mass of gas expelled per second multiplied by the gas speed relative to the rocket (known as the exhaust velocity). Thus, the higher the speed of the gas the smaller the flow required. The smaller the flow, the less will be the total quantity of propellent required for a given mission, thus enabling a smaller vehicle to be used. Therefore, the aim in a rocket motor is to obtain as high an exhaust velocity as possible.

Although chemical rockets will serve us for some time yet, we are approaching their absolute limit of performance and much thought is being put into radically new ways of accelerating gases in rocket motors. One of the most promising means at present being investigated is the acceleration of 'ions' by electrical means. Ions are atoms which, instead of being electrically neutral, as they usually are, have had some of their negative charges (electrons) removed, which leaves them in a positive state of charge.

These positively-charged ions can be accelerated to extremely high speeds by electric or magnetic fields. The speeds that can be reached in practice are ten or even a hundred times higher than the gas speed of the best chemical rocket. One of the best ways to produce suitable ions is to heat either the element caesium or rubidium on a hot tungsten surface. The ions can then be accelerated by means of suitable electrodes to any required exhaust velocity. The electrons that have been removed to produce the ions

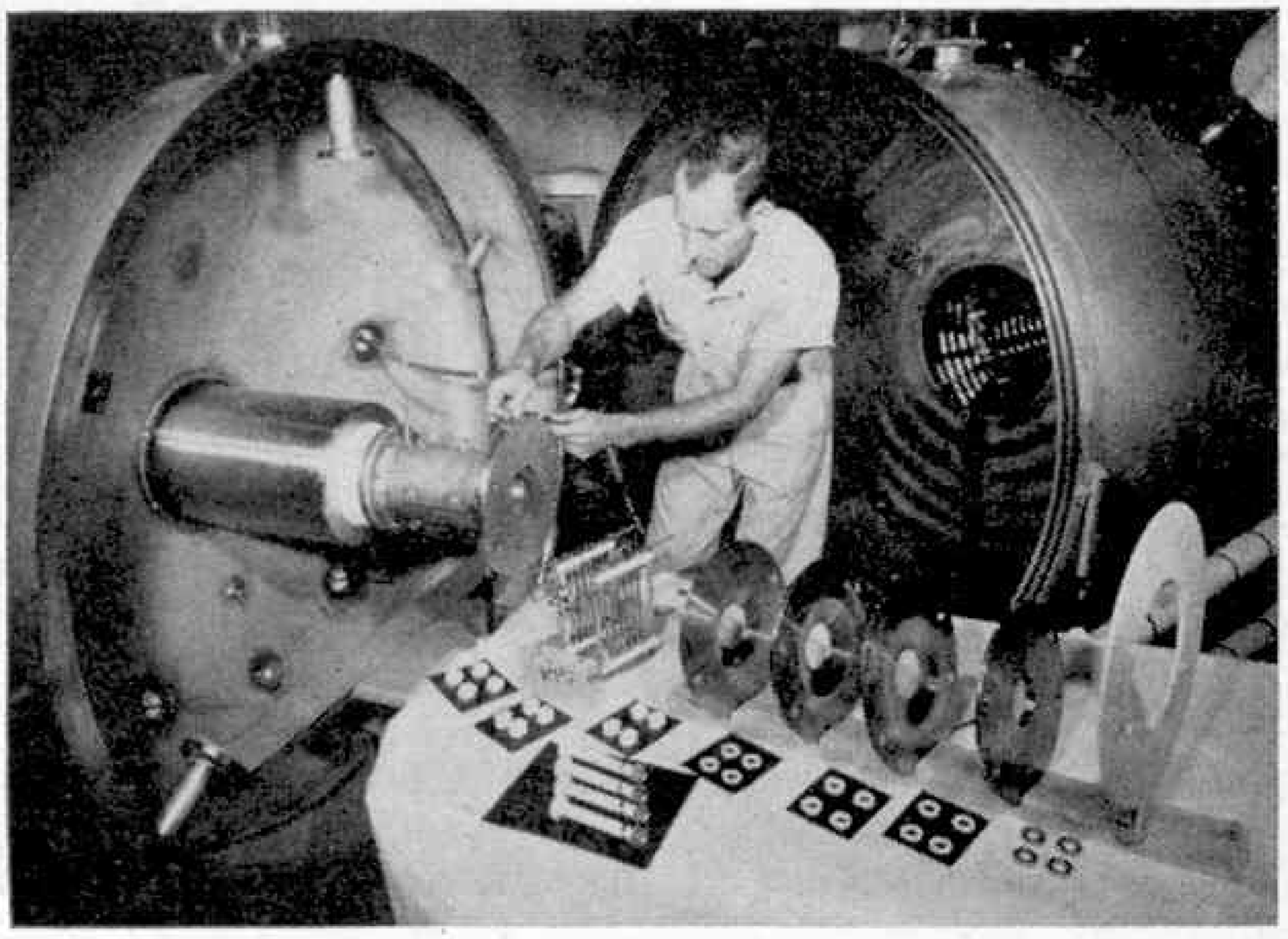


Fig. 1. A small experimental ion rocket being assembled for test. The vertical strips at the left-hand end of the table are the tungsten ionisers; the discs are the electrodes for accelerating the ions.

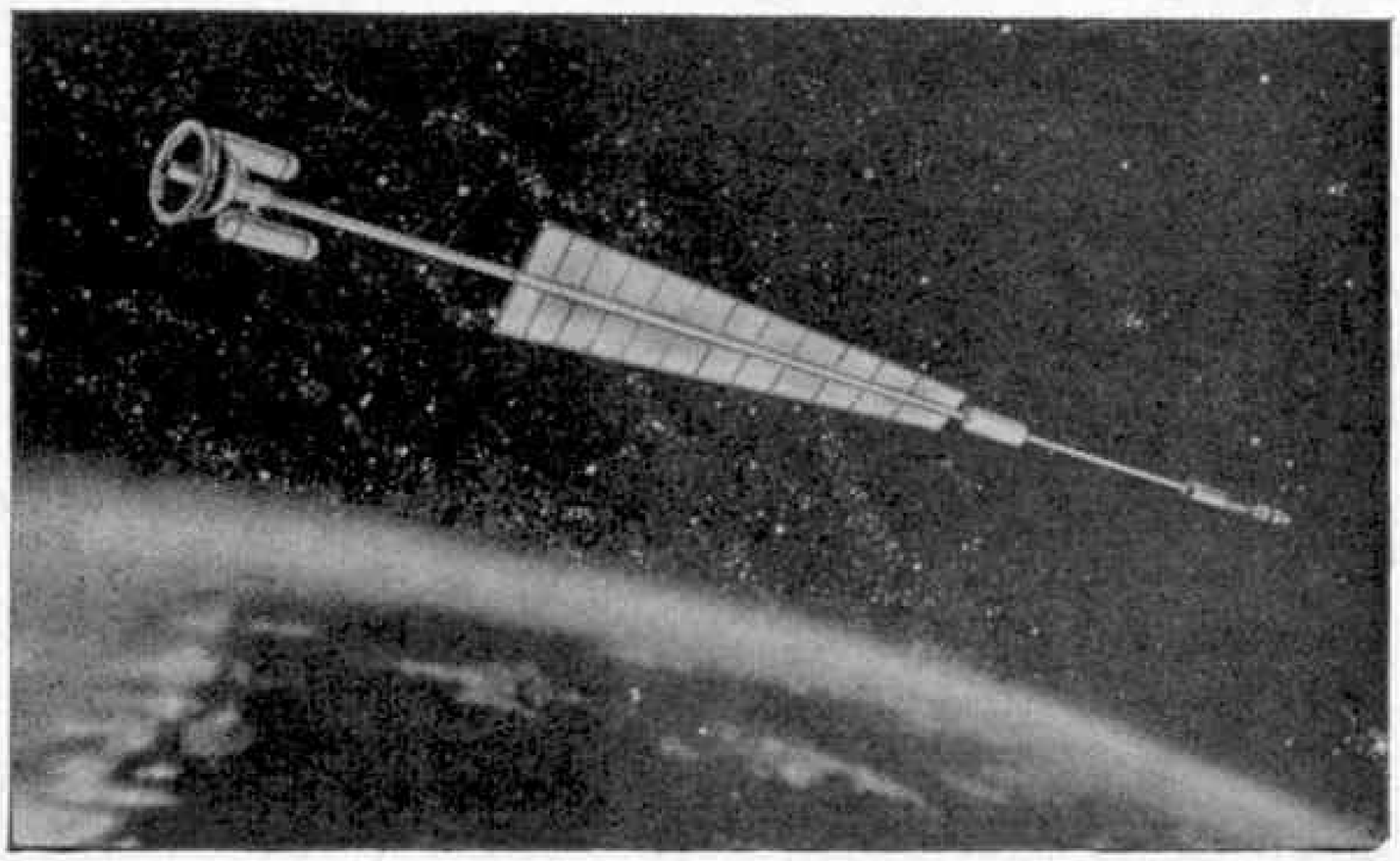


Fig. 2. An ion-propelled space-ship. Note that for safety the nuclear power-plant for producing the electricity to run the ion rocket is mounted well away from the cabins.

must also be ejected, otherwise a large negative charge would build up on the spaceship and finally the ions would not be able to escape at all and the ion rocket would produce no thrust!

You may well ask why the ion rocket has not taken over completely from the chemical rocket as it has such a wonderful performance. The reasons are that it will work only in a vacuum and that practical units will be limited to a few pounds of thrust at most. Consequently, such motors have, until recently, been of little practical interest but now several organisations are actively developing them for use in future space probes.

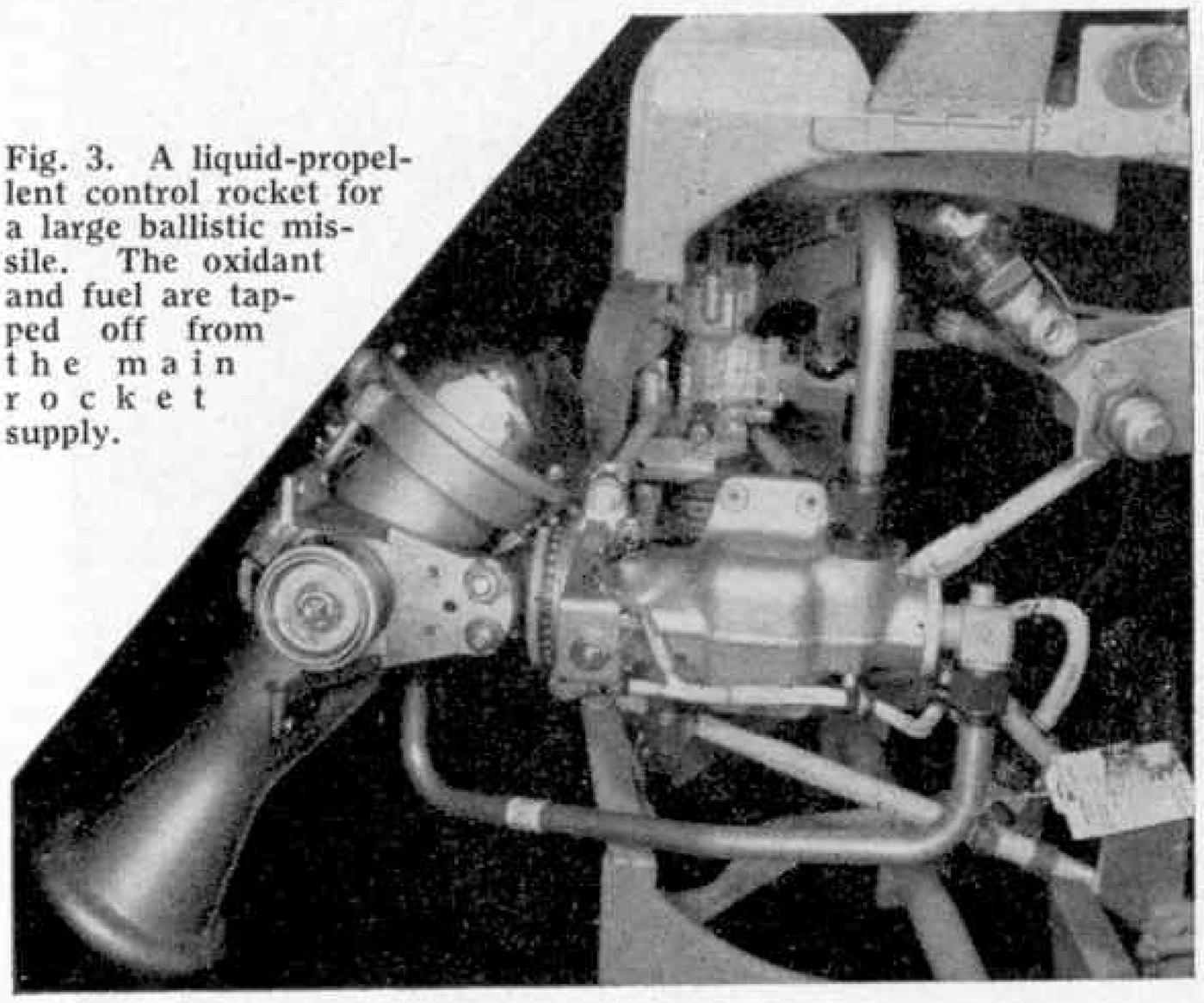


Fig. 3. A liquid-propellent control rocket for a large ballistic missile. The oxidant and fuel are tapped off from the main rocket supply.

In space, the electricity to run an ion rocket will be produced from a nuclear power unit. As such a unit has an overall efficiency of 40 per cent. at best a great deal of waste heat will have to be got rid of. In space, the only way to do this is to radiate it. A proposed design for an ion-propelled vehicle is shown in Fig. 2. and it can be seen that it is largely designed around the radiator. The electrical power required to run an ion rocket is extremely high and in consequence the waste heat will also be extremely high. The permissible size of radiator limits the thrust that can be allowed and in practice this is unlikely to exceed a few pounds (compare the 1,000,000 lb. chemical rockets now under development).

The technique for using ion rockets in space would be as follows: first, the space vehicle would be placed in a satellite orbit by means of conventional rocket boosters, then the ion rocket would be switched on and the vehicle would gradually accelerate and very slowly spiral out from its orbit until it had sufficient speed to accomplish its journey.

FINE CONTROL ROCKETS

Low-thrust rockets are needed on long-range missiles and satellite launchers for control purposes. The path to be taken is carefully planned but even very slight errors caused, perhaps, by the main thrust not being quite in line, or by a gust of wind, could put a vehicle right off course. To swing the vehicle round so that it points in the right direction requires a slight offset thrust and this is provided by small rockets. There are usually two of these so arranged that they can be swivelled. On large missiles these motors use the same propellents as the main motors, but in the smaller missiles steam from the

(*Continued on page 373*)

SATELLITES STILL IN ORBIT

Name	*Date launched*	*Date due down*	*Weight (lb)*	*Period (Min.)*	*Orbit Min. height (miles)*	*Orbit Max. height (miles)*
Explorer I	1 Feb. '58	1962	30.8	108	214	1,209
Vanguard 1	17 Mar., '58	about 2060	3.25	134	409	2,447
Lunik I	2 Jan., '59		3,245	15 months	Orbits Sun	
Vanguard II	17 Feb., '59	about 2010	21.5	125	347	2,046
Pioneer IV	3 Mar., '59		13.4	407 days	Orbits Sun	
Explorer VI	7 Aug., '59	End '61	142	750	145	25,000
Vanguard III	18 Sept., '59	about 2110	100	130	319	2,326
Explorer VII	13 Oct., '59	1980	91.5	101	345	674
Pioneer V	11 Mar., '60	Indefinite	94.8	311 days	Orbits Sun	
Tiros I	1 April, '60	1980	270	99.2	128	467
Transit Ib	13 April '60	April '61	270	96	232	443
Midas	24 May '60		Not yet available			

The new specially designed Yorkshire Aviation Fueller is seen here with the B.E.A. Comet 4B jet airliner. Illustrations by courtesy of SARO (Anglesey) Limited.

New 10,000 Gallon Aircraft Fueller

By the Editor

AN aircraft fueller which has a capacity of 10,000 imperial gallons and is among the biggest of its type in the world was recently handed over to the British Petroleum Company, Ltd. at the works of A.E.C. Ltd. Designed and built by SARO (Anglesey) Ltd., it was the first of the new Yorkshire class of fueller for Air B.P., the aviation service of The British Petroleum Company. It is now in service at Dorval Airport, Montreal.

The latest jet airliners have inaugurated a new era in commercial aviation with their demands for bigger fuel loads without increase in fuelling time.

Fuel deliveries of 18,000 to 20,000 imperial gallons now have to be catered for within a total fuelling time of 20 minutes and the Yorkshire Fueller, with its delivery rate of 750 gallons a minute, provides a quick and flexible means of supplying this service. In fact, it delivers the equivalent of the motorists "Five gallons, please" in less than half a second.

Power-assisted Steering

The Yorkshire Fueller incorporates the most modern techniques developed by the oil companies and the supply industry and sets a high standard in aviation servicing equipment. It is built on the semi-trailer principle and employs the A.E.C. Mammoth Major as tractor unit. This vehicle has an 11·3-litre diesel engine with an all-speed governor. Special features include a fully articulated rear bogie and power-assisted steering.

The wheel base of 18 ft. 9½ in. is greater than the normally accepted tractor type in order to accommodate the pumping and delivery equipment fitted behind the cab. Safety devices include a spark arrester in the exhaust system.

The semi-trailer tank, with its huge capacity, is divided into three compartments and is of all-welded aluminium alloy construction.

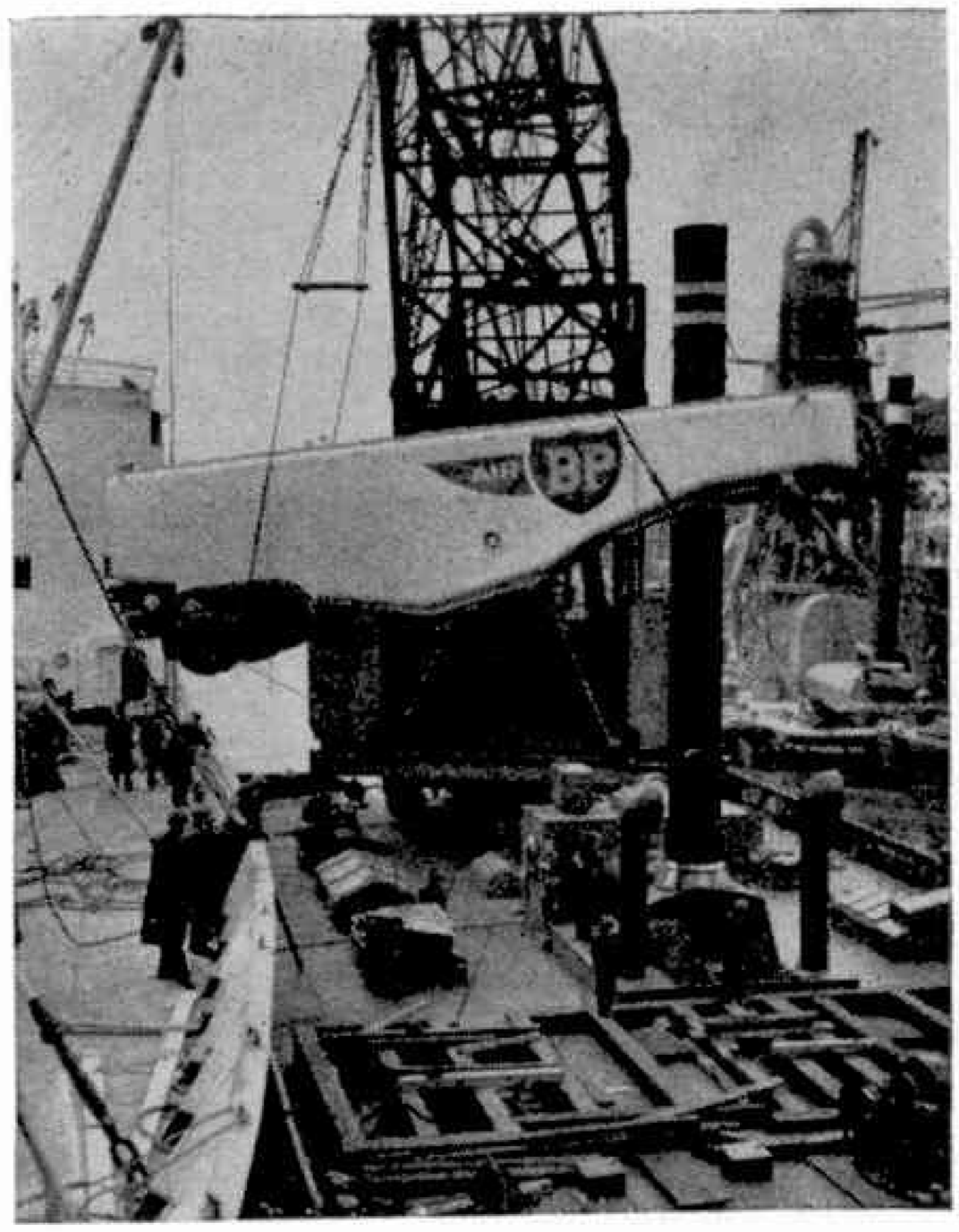
To meet the high standard of filtration required for jet fuels the fuellers are equipped initially with fine particle filters. Special pressure control equipment is also used.

Bright New Colours

Clad in the bright new Air B.P. house colours, the Yorkshire is, in fact, the product of the ingenuity of many industrial concerns. The final result is a streamlined economical efficient vehicle which enables vital services on the ground to keep pace with the progress made in the air.

The entire pumping circuit, designed and constructed by SARO (Anglesey) Ltd., is mounted in pack form on the tractor unit

This view taken at Salford Docks shows the 10,000 gallon trailer tank of the Yorkshire Fueller being loaded on board the "Manchester Mariner" for shipment to Canada.



with all components grouped for simplicity of operation and maintenance. The all-aluminium tank is in frameless semi-trailer form, and is of special design incorporating a carefully-planned sloping base surface to ensure maximum drainage to test sample draw-off points, etc.

The use of aluminium for the tank and the clean external form eliminates the need for costly and bulky external framework and panelling, and appreciably increases the pay-load possible within the chassis limitations.

The vehicle is approximately 51 ft. long, 7 ft. 10½ in. wide, and 10 ft. 6 in. high, and meets the normal road regulations of all countries in which it is expected to operate.

The complete unit has successfully undergone exhaustive road tests and pumping trials. The road trials including manœuvring, traction, braking and rough surface handling throughout which comprehensive electronic strain gauge equipment recorded the behaviour of the novel tank design under fully stressed conditions.

This is believed to be the first time such searching tests have been applied to a vehicle of this size and duty. Strain gauging was carried out by the de Havilland Aircraft Co. Ltd.

Mobile Task-Forces Help Motorists

Radio-controlled mobile task-forces have been put into action by the Royal Automobile Club to help British motorists during the summer.

Known as Mobile Service Units, the new groups are completely self-contained and, at very short notice, are able to rush to wherever there is a large concentration of cars, motor-cycles and other vehicles.

Each unit consists of a caravan-type radio-equipped mobile office with attendant Land Rovers and motor-cycle combinations. In its initial stages the scheme has operated in the Midlands, Home Counties, the West Country, Scotland and Northern Ireland.

Not only can these units bring all the usual R.A.C. services to the motorist and motor-cyclist, but they also provide extra links in the Radio Rescue Service which now covers most of the United Kingdom. The new service supplements the usual Mobile Offices which, once again, are operating at agricultural shows, sports events and seaside resorts throughout the length and breadth of the British Isles.

Easing the Hazards of the Seaway—

(*Continued from page 323*)

Basically, a Decca chain consists of four stations—three "slaves" normally situated about 80 to 100 miles from a central Master Station in star formation. The master and each slave lay down a hyperbolic pattern of radio position lines so that in any position within range two of these patterns are available for a fix. These radio signals are received in the ship and automatically converted into three dial readings which, when plotted directly on a special chart overprinted with the Decca lattice, give an accurate position immediately without adjustment or calculation. The degree of accuracy of the system at ranges of up to 50 miles is ± 50 yards by night, errors being caused by interference with the ground-wave signal by the unwanted sky-wave signal after sunset. Even at a range of 200 miles the positions can be obtained to within a quarter of a mile.

The coverage afforded in the Persian Gulf by the Navigator System will be on a 24-hours-a-day basis, and will operate on the same frequencies as already exist on all north–west European coasts, the Atlantic coasts of Canada, the St. Lawrence Seaway and the northern part of the United States. Chains are also being set up to cover north-west Spain and parts of the Indian coasts.

Aircraft, too, are extensively using this type of electronic aid, which is particularly suitable for the helicopter. The pilot has a chart in front of him on which his course is automatically traced.

But even if the ancient art of navigation is to be reduced to little more than taking dial readings and referring them to a chart, the safety of the vessel or aircraft will still ultimately hinge on the skill of the captain and the efficiency of his crew.

FLORIDA'S LOST WORLD

● The Everglades of Florida have always held a fascination for people of all ages. In this intriguing article the author tells of some of the dangers that lurk in these vast swamplands.

By
SIDNEY ALLINSON

ONLY twenty miles from the glittering city of Fort Myers, Florida, there lies a land as primitive as when time began. It is a land with no permanent human inhabitants; its brooding silence is broken only by such sounds as the booming of alligators or the harsh cries of multi-coloured birds.

Venomous water-moccasins, which can grow to a length of six feet, swim in sinuous curves between the water-logged roots of centuries-old cypress trees; red-shouldered hawks flit through the branches festooned with grey mists of Spanish moss. Below, the giant alligators sun themselves on green-slimed mudbanks, their lidless eyes alert for prey among the uncharted savannahs of palm and sawgrass.

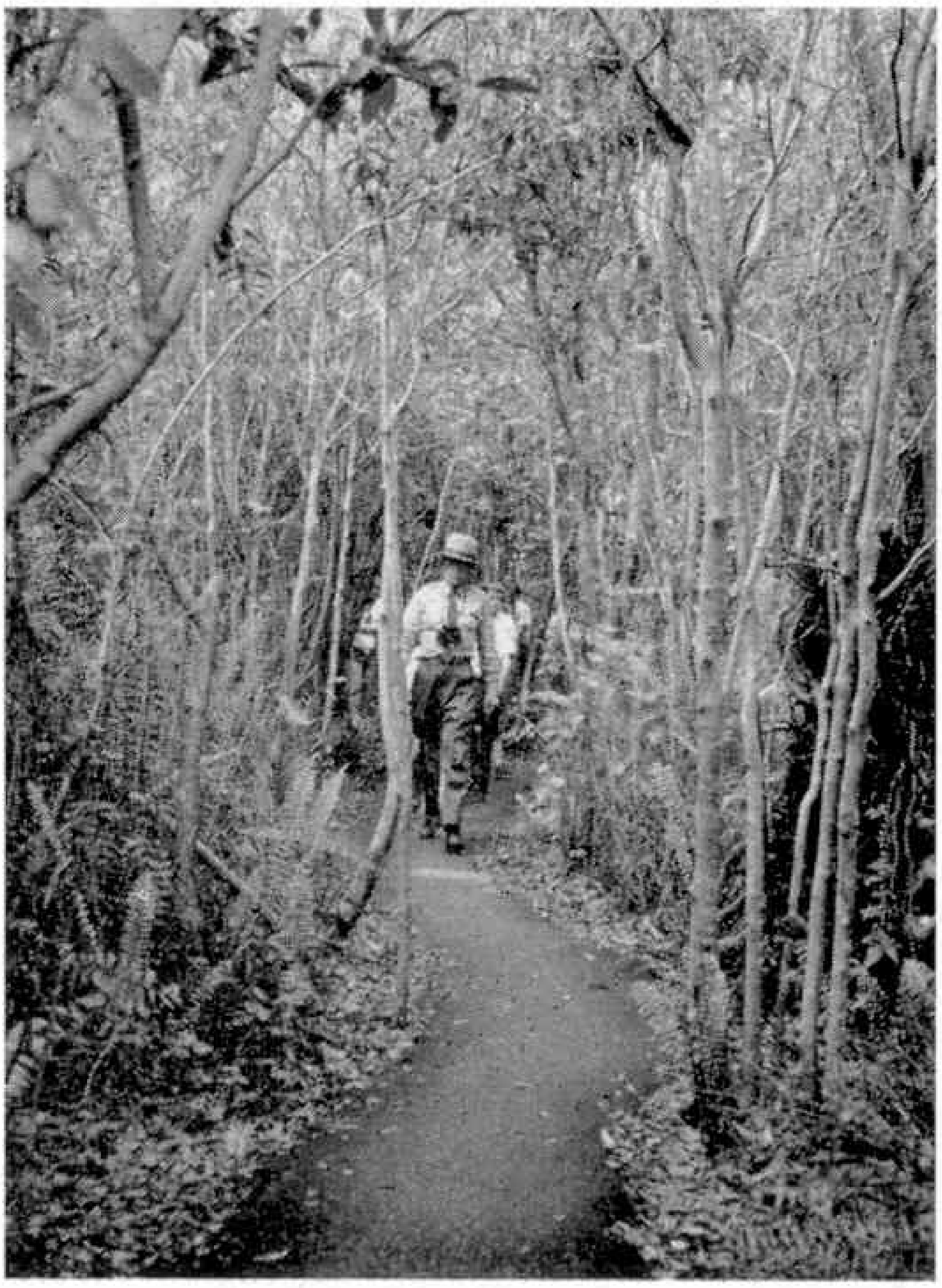
Countless otters hunt underneath dense acres of water lettuce which obscure the surface of deep, black pools teeming with shoals of game-fish; bright-banded coral-snakes, ringed in red, black and yellow, ooze their deadly way through masses of luxuriant orchids, and fierce bobcats lope along game-trails in search of whitetail deer. Above it all flamingos fly in pastel flocks above enormous, hidden "wet prairies", where thousands of plumed egrets feed near inaccessible rookeries.

Sub-tropical Wonderland

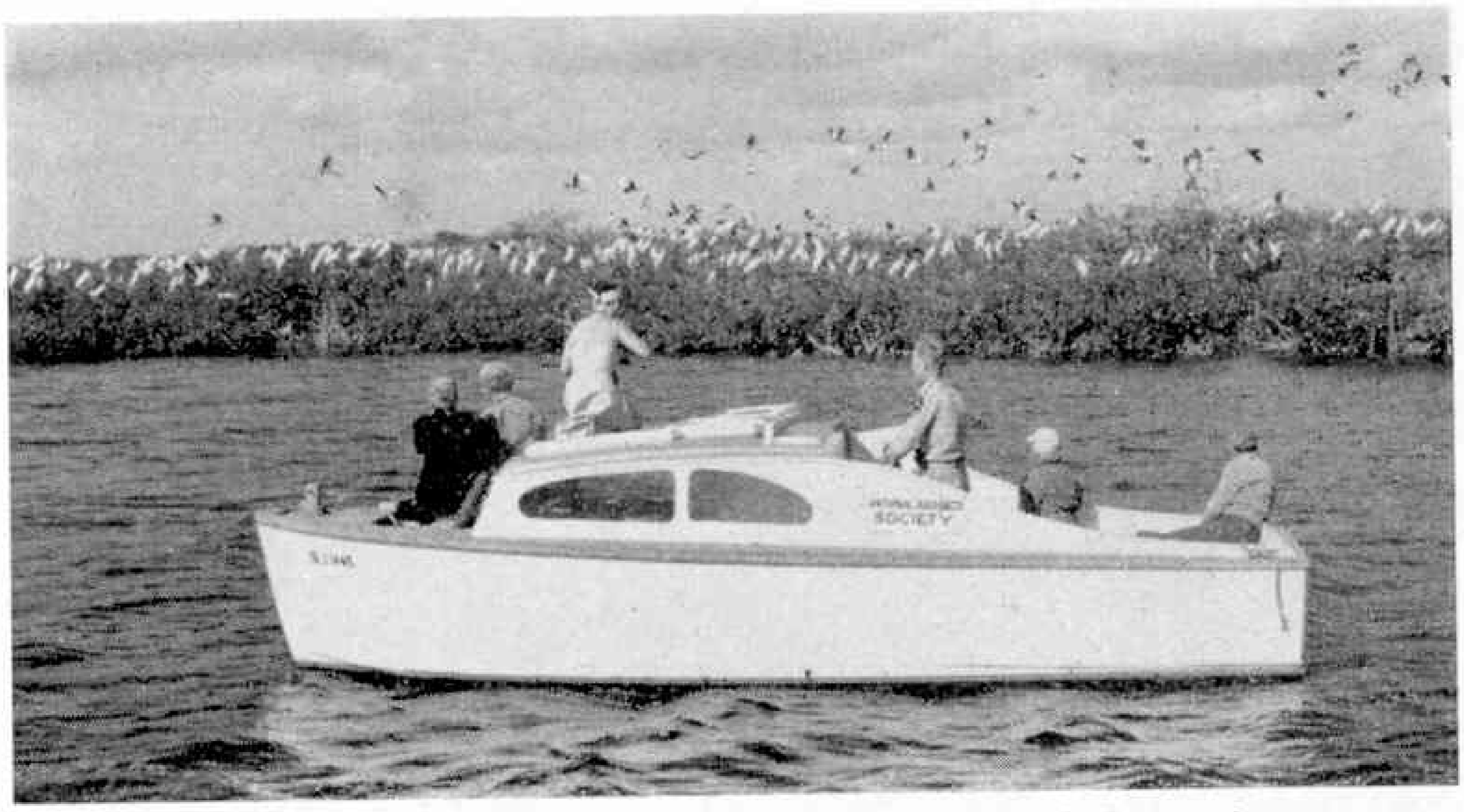
This primeval land is Corkscrew Swamp, a sub-tropical wonderland of bright sunlight and inky shadow which sprawls from the Tamiami Trail to the shore of the Mexican Gulf.

Corkscrew Swamp stayed a forbidding mystery long after other areas had been opened up, mainly because few people could see any use for such a tangled wilderness. It was too waterlogged for farmers, who raised their crops in more arable sections of the State. Fishermen settled their villages along more hospitable shorelines. The United States Army had little interest in penetrating it after the bitter Seminole War with the Indians in the nearby Everglades Swamp. The only visitors to brave the bogs and reptiles of Corkscrew were trappers, hunters and the occasional timber-cruiser.

It was first these hunters, then the lumbermen, who drew official attention to this mysterious area. Guns roared continuously in an orgy of destruction when bands of professional hunters moved in to butcher the magnificent American egret for its luxuriant plumes.



Following the trail in a Florida swamp. The photographs illustrating this article are by courtesy of the Florida State News Bureau.



Corkscrew Swamp. A water tour of a rookery of rare Snowy Egrets.

By 1912, the hat makers' demand for these feathers had caused such a large number of ruthless men to go after the swamp birds that the National Audobon Society sent in wardens to protect the surviving egrets from extinction. Shortly after this, mass protests by American bird-lovers had the Government outlaw any further traffic in plumage.

Even the prolific alligator was threatened with extinction for a while. The high prices offered for his hide by leather goods manufacturers brought a new wave of thoughtless hunters. Once again, conservation agencies stepped in to protect wild-life.

Exploring the Maze

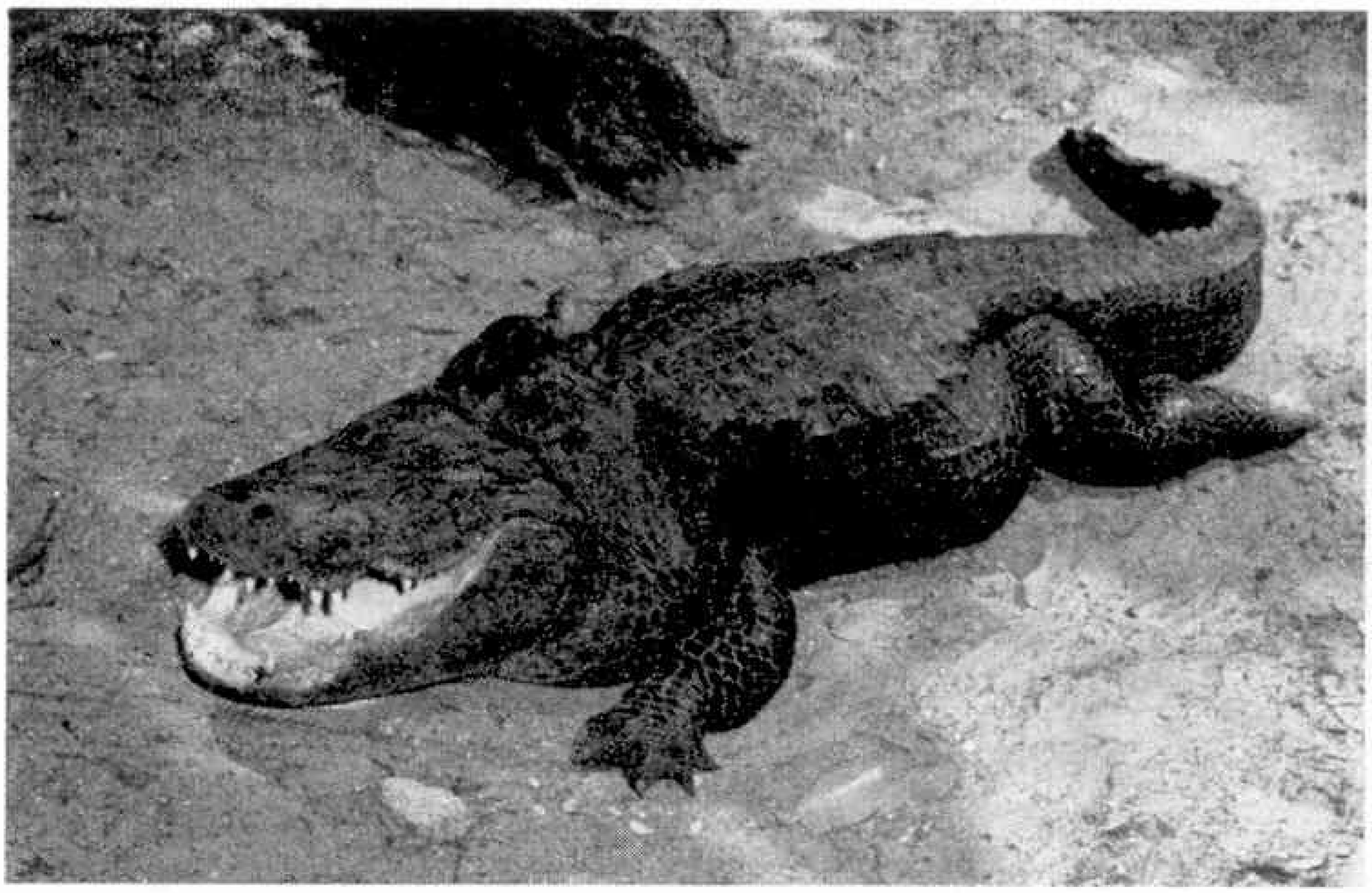
Timber-cruisers noted the great stands of patriarchal cypress trees and the swamp rang with the sounds of loggers' axes and steam saws. This logging operation, which would eventually have denuded the land, was stopped five years ago by the Audobon Society's purchase of the entire area as a sanctuary for the thousands of egrets which now roost there.

Although Corkscrew Swamp is still left largely to its original furred and feathered inhabitants, thousands of casual visitors now explore the cypress maze from the safety of a 4,000-yard boardwalk. This raised path leads into the most dense and unspoiled part of the jungle growth, and an outdoor-man's delight of teeming wild-life is revealed without even the need for getting one's feet wet.

The more hardy and daring visitor can plunge off kneedeep into the mud and water, but there are reptiles about, and myriads of insects. This method of travel is hot, wet and exhausting. Cypress roots tangle underfoot, offshoots bark the knees, bog holes are frequent and it is impossible to travel far without a boat.

Jumping off point for this swamp tour is Corkscrew Station, reached after a hair-

The only practical transporation through the vast Everglades is by means of the airboat, which is propelled by an aircraft engine. Here, a couple of airboats, in the service of the Everglades National Park, cruise over a shallow prairie.



Alligators in the slime of the Florida swamp-lands.

raising jeep ride over primitive roads. Should the visitor wish to travel through the area without using the facilities of the Audobon Society, he must be accompanied by an authorised local guide.

Behind the seemingly inpenetrable defences live an enormous number of birds and mammals. Audobon Rangers are still cataloguing the hundreds of species of bird-life which find sanctuary there. The animals known to live there include panthers, wild pigs and black bears. The rare Florida crocodile guards the sea marshes and rivers to the west of the swamp.

The black and dappled panthers which lurk in Corkscrew are the last of their breed in the United States. Seldom seen, the only reminder of their presence is an infrequent night cry of a panther's challenge—a blood-chilling sound.

Alligators can be seen everywhere—in musky colonies round every jungle pool, lazily eyeing camera-carrying tourists; sometimes eating baby alligators or streaking underwater towards any likely-looking splash. During the mating season, their bellowing calls ululate for miles across the wilderness.

Water-moccasins abound, a constant reason for wariness and making any foot journey something less than a casual stroll. When angered, this snake often opens the mouth widely, disclosing the white lining. This habit has given it the common name of "Cottonmouth".

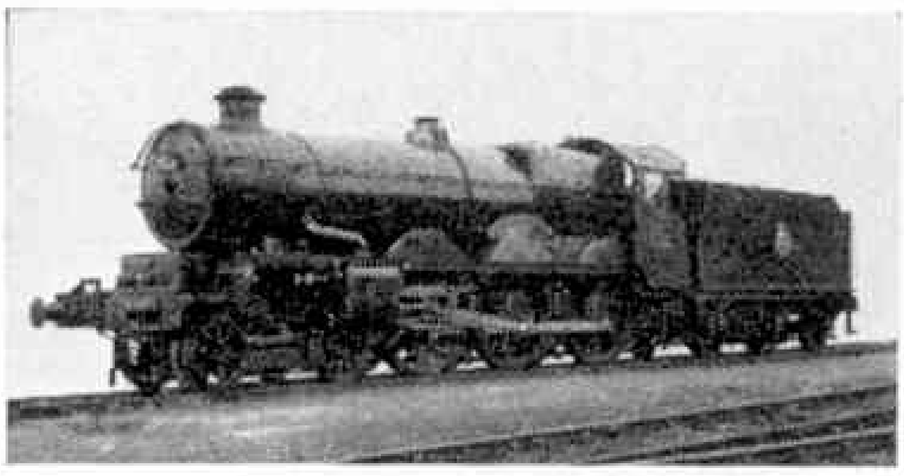
So many turtles live in Corkscrew that they are to be seen everywhere. There are gopher turtles which seem to spend their lives in frantic burrowing, box turtles that can close their shells, forming an armour for head and limbs, chicken turtles and snapping turtles—king-sized monsters which could shear off the toes at one bite.

The swamp harbours racoons, often seen nimbly washing their food in clear pools; muskrats, wolves, gray fox, opossum and the Florida skunk. This last-named is a little fellow who probably commands more universal respect than any other inhabitant. Tastefully dressed in black and white polka dots, this usually placid gentlemen is terrible in his anger. When alarmed, he kicks up his heels and sprays out a fine green mist which makes any creature unfortunate enough to receive it hate himself for weeks afterwards.

Huge colonies of wood ibis nest in cypress clumps, their untidy nests strident with the complaints of their hungry young. This bird is actually a stork, the only one in North America. Its naked, scaly head is similar to that of a vulture and it is nicknamed the Spanish buzzard. Communal groups of more than 50,000 are common, their white plumage covering the branches.

Treasure Hunters

Strange legends about the swamp are told by nearby residents, stories which have been handed down through generations of families who came to Sanibel Island as early settlers. One of the strangest concerns two chests of gold doubloons which Jose Gasparilla, scourge of the Florida coast, is said to have buried on one of the islands in Corkscrew. This was in 1821, shortly before he sailed off to do battle with a shabby *(Continued on page 373)*



Railway Notes

By R. A. H. Weight

With the Driver of "The Master Cutler"

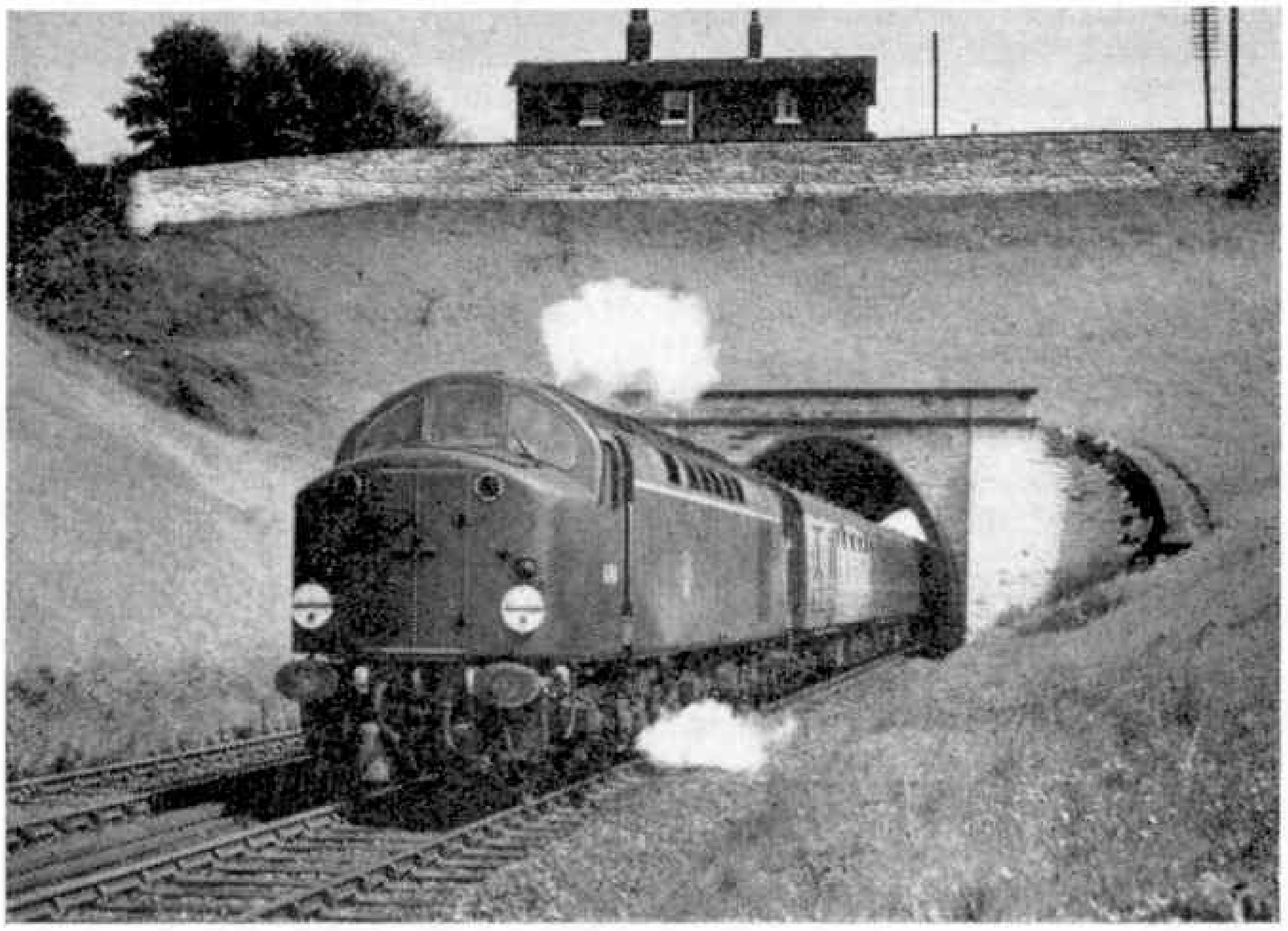
THE Master Cutler is one of the fastest expresses in each direction 'twixt London and the North. It provides from Mondays to Fridays the quickest-ever service both ways between Sheffield, Retford and London, King's Cross. Largely patronised by business men it leaves Sheffield, Victoria, at 7.20 a.m. and King's Cross at 7.20 p.m. on a 2¾ hour overall timing for 161½ miles. The train usually consists of six luxurious 1st and 2nd class Pullman cars weighing, with passengers etc., more than 250 tons. In addition to its early morning and evening trips, it also makes the same 323-mile round trip during the day with two additional stops. All journeys are almost invariably operated by type 4 D200 class 1 Co-Co 1, 2,000 h.p. diesel-electric locomotives based at Hornsey, London, manned by Sheffield (Darnall) crews.

The Flyer was Early

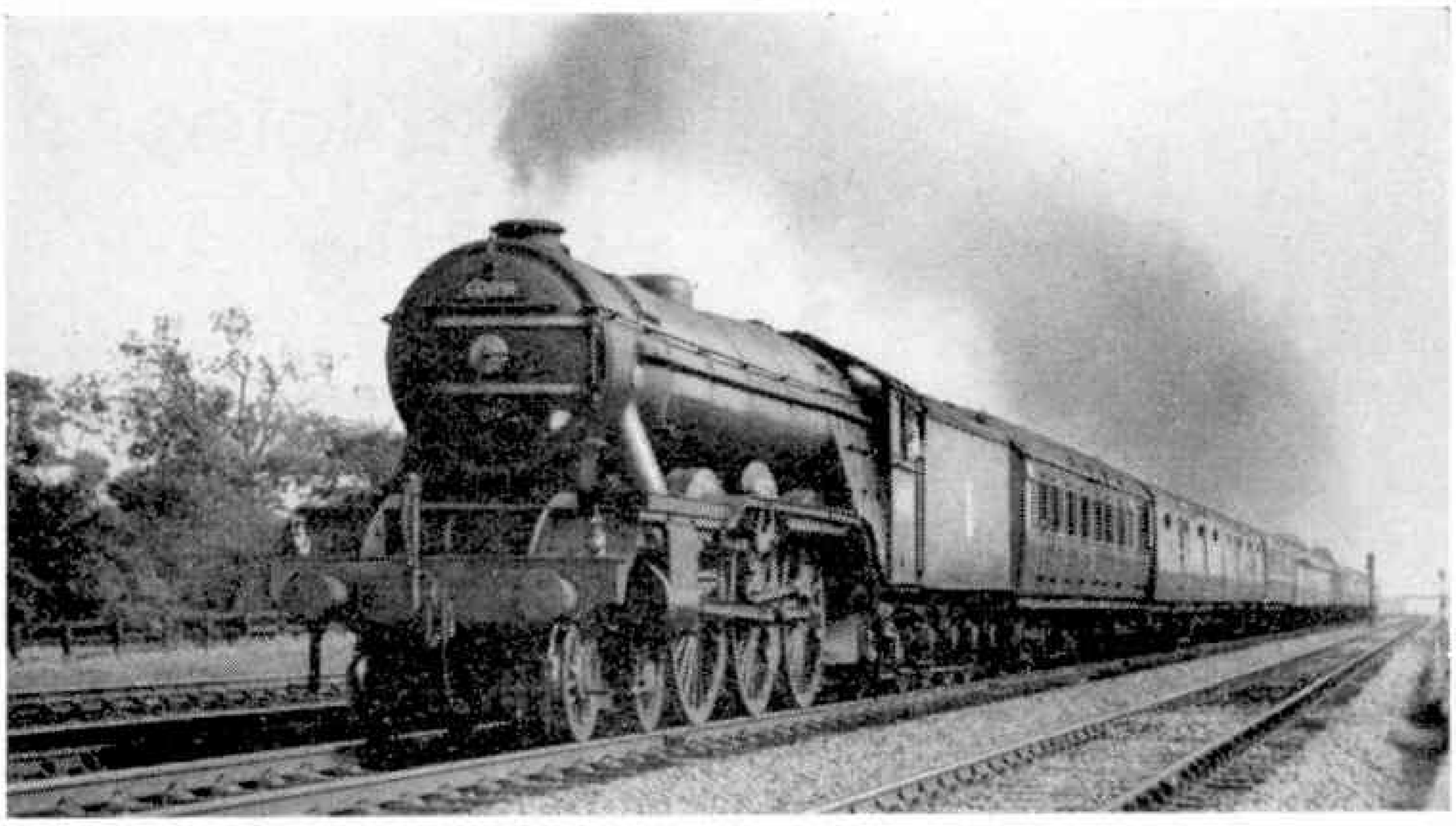
During May I was privileged to travel in the keen and hospitable company of Inspector Cockayne, Driver Charlesworth, Fireman Cocker, on No. D208, when *The Master Cutler* was whirled down to a signal stop 138 miles from King's Cross in 122½ min. at an average of 68 m.p.h., including extra slowings for signals, then track repair work around Peterborough and Tallington, just over half-way. All normal speed restrictions were carefully observed. Being more than 5 min. early, we were pulled up outside Retford, Notts., the first and only booked stop, because the principal-stations express to Hull leaving London over 50 min. sooner was at the platform and there are not many minutes margin! Even so, the flyer was in Retford nearly 2 min. early, having improved decidedly on the 130-min. schedule for 138½ miles which can be an arduous one at times, but would also be well within the capacity of most steam Pacifics.

Over an undulating course along the G.N. Line section of the East Coast route famous for high speed we had covered 71 miles in the first hour, 137 miles in 2 hours, breasted the summits of lengthy up gradients, for example, at 63-65 m.p.h. Potters Bar; 70-72 m.p.h. to Stoke Box, Lincs., 100 miles from London; attained maxima of 88-90 m.p.h. four times, also several lesser 80's. Like the locomotive efficiency (and doubtless the service in the train) operating was excellent.

It was a murky, damp evening but in the driving cab all was snug, warm, quiet and comfortable. What a contrast, I thought, to my footplate express trips in the past on that route on rolling, C1 Great Northern Atlantics, much exposed to the weather,



Type 4 diesel-electric locomotive D206 on a Newcastle – King's Cross train routed via Wakefield because of engineering work on the main line via Selby. Photographed near Burton Salmon by K. Field.



No. 60091 "Captain Cuttle", one of the original A3 class, speeding near Thirsk with a down East Coast express. Photograph by C. Ord.

or the different types of Gresley Pacific, steadier and more protected—yet with the swirling coal dust and the considerable noise of concentrated power and fast-moving mechanism so close to one.

The view right up in front on these diesels is remarkably good. A door and a steel partition mask the roar of the enclosed, 16-cylinder "V" diesel engine, supercharged and operating on a 4-stroke cycle, which is coupled to the main generator designed to produce electric current on a continuous rating of 1,800 amperes at 730 volts D.C. This powers through spur gearing the six traction motors each actuating a driving axle. Average tractive effort is estimated at 30,900 lb., roughly in the 7P category. There is interior communication at the side of the motors and "machinery" to the driving cab at the other end.

Oil fuel tank capacity is 700 gallons, plus 200 gallons for firing the steam boiler that warms the train and provides hot water for washing, etc. The water tanks slung between the bogies carry 800 gallons and to replenish we picked up at two track troughs respectively about 150, then 250, gallons just by "pressing a button". Dials on the fireman's side of the cab show the amount of water in the tank, and the pressure of steam heat being put through the train pipes, similar to a steam locomotive.

Crew's Swivel Chairs

Heating and electric light are provided in the driving cab; padded swivelling chairs for the enginemen, while close to the driver's handy controls are dials indicating the speed, brake (combined vacuum and compressed air) pressure, and the amperage of the electric power being delivered to the wheels. This fine run was economically achieved at an average of 1,300–1,500 amps.

The "A.W.S." or Automatic Warning System connected to the distant signals, to which I made reference last month, worked perfectly and numerous were the the all-clear bell indications heard in the cab, with only three or four warning hooters. Many of the signals down the lines are now of the colour-light type and stand out clearly in light or dark weather.

At Retford the "*Cutler*" leaves the main line to Doncaster and the North and joins, by a sharp curve, the ex-G.C.R. cross-country route from Lincolnshire to Manchester. The last 23 miles to Sheffield are not so fast; there are up and down gradients and a dead slowing was called over a bridge which was in engineers' hands. With matters well under control, however, at about 10.0 p.m. the lights and hills of the Cutlery City, with its great industries, were close and journey's end only a minute or two away.

Passengers alighting at Retford and going forward in a fast diesel set to Doncaster can make useful late evening connections to the Leeds area, York, etc.

Good "A3" Pacific Runs

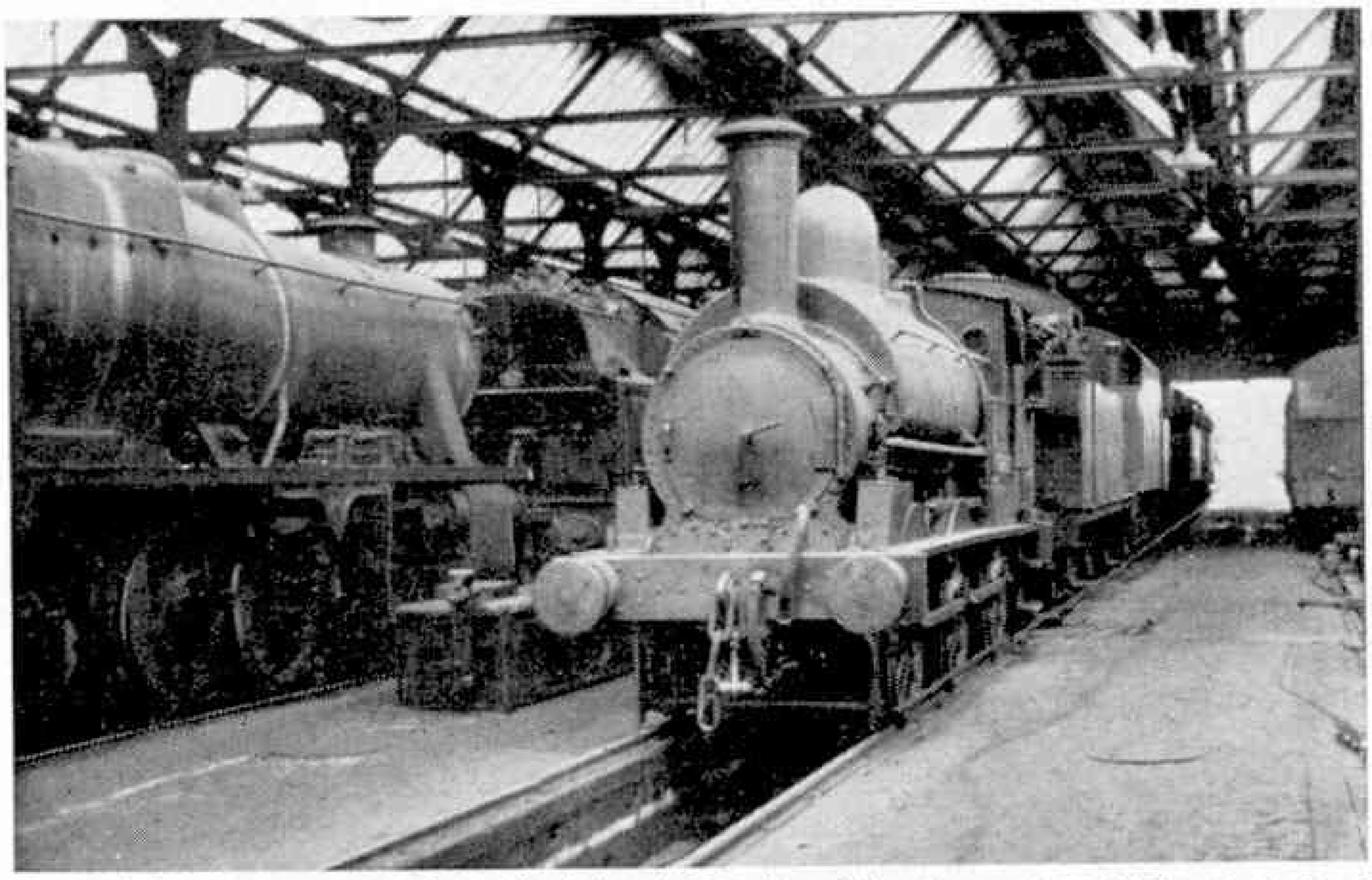
On timings not quite so slick as those of the Sheffield Pullmans, although with heavier loads, the modernised if somewhat elderly 7P A3 4-6-2s are still giving excellent performance. Instances include some of the fastest and longest non-stop runs between King's Cross, York and Newcastle, London–Doncaster–Leeds and so on, as well as with other principal main line trains making more stops. Several friends have recorded journeys now mentioned.

Hauling the heavy southbound *Flying Scotsman* in Summer, on what was certainly an A4 or 8P assignment with 13 coaches, or about 460 tons gross, No. 60048 *Doncaster* in spite of seven extra slowings, had time in hand at Potters Bar and had covered 255 miles without a halt in 262 min. from Newcastle, demonstrating first-rate performance and steaming. Near the peak evening period on a busy day there were short signal stops and checks along the approaches to King's Cross, although it was grand work to complete the arduous 268-mile run in just over 4¾ hours and drop no more than a minute or two overall.

No.60055, *Woolwinder*, with "11-on" gained 7 min. on a 79½-mile non-stop run from Doncaster to Peterborough, part of a through journey back to London from Leeds, running well with maxima of 80–82 m.p.h. north of Newark; 88 down Stoke bank. There was a repair slack, but a mile-a-minute average was maintained.

Memories were revived recently of my first Pacific or long-distance footplate run a good many years ago on what was then No. 2562 *Isinglass*, one of the original Gresley Pacifics. Its boiler then carried 180 lb. boiler pressure, but this is now raised to 220, with increased superheat, double chimney and other features of rejuvenation like the rest of the class. I saw the engine lately as No. 60063 and received a log showing that on Huntingdon's fastest train down from King's Cross in the evening, it reached the county town in a few seconds over 59 min. for 59 miles including a repair slack, compared with the 61 min. allowance, with an extra-heavy load of "12", 425 tons full. The 27 miles from passing Hitchin to stopping at Huntingdon were reeled off in 21¾ min.

Astonishing was the achievement by No. 60106, *Flying Fox*, which improved upon the tight 104 min. timing for the 105½ miles down from London to Grantham on the 9.0 a.m. express to Newcastle, with "9-on", although stopped before Stevenage and severely checked by signals and track renewal until beyond Hitchin. Maximum speeds were up to 86/90/88 afterwards, but finer work was still to come. The long rise to Stoke Box, between Peterborough and Grantham, was rushed at an average of 79 m.p.h. with a minimum of 71, perhaps the fastest ever recorded with an A3 and anything like such a load.



One of the numerous and long-lived Special Tanks of the former L.N.W.R., the last of which has recently been withdrawn. Several of the class, including the subject of this picture by J. A. Fleming, were allocated to Wolverton Carriage Works.

Railway Modernisation Progress

Much present and planned activity is described in a comprehensive, impressive report received from the British Transport Commission. The number of steam locomotives, although they are still a mainstay on many routes, will continue to fall as about 900 main line diesel locomotives, and about 1,750 shunting units are expected to be in service by the end of 1960. De-luxe diesel Pullman expresses, which will provide an exceptional standard of comfort and accommodation, are almost ready for service on several trunk lines. More and more wagons are fitted with continuous vacuum brakes, allowing much higher speeds with quicker delivery of freight. Car-Sleeper special trains for passengers and their cars to holiday areas, ports, etc., have proved popular and are now in operation from London, Manchester, Newcastle, Glasgow, Sutton Coldfield and elsewhere.

Diesel multiple-unit set trains will be increasingly operated locally between towns and across country.

Making a SPLASH!

FINE NEW HORNBY SPEED BOATS

Racing at speed through the water, this R.A.F. Range Safety Launch leaves a broad white wake behind it.

ONE of the great attractions of the products made by Meccano Limited is the fact that the activities they cater for can be shared between father and son. This has been one of their strong characteristics over the years and the latest development in the Meccano world follows the same course.

Years ago, when many of the dads of today were teenagers, Meccano made world-famous speed boats. They were fast and dependable, with a variety of models to choose from, and there must be many readers of the *Meccano Magazine* who recall these splendid launches.

Now, for the first time since 1939, Hornby speed boats are with us again, but this time, instead of being made in metal, they have all the refinements and improvements of modern plastic techniques. They are beautifully moulded in the pattern which, through the years, has stamped all Hornby products with the mark of craftsmanship, and they are sure to delight any boy.

There will be a series of models, the first two of which should be in the shops by the time you read these notes. First there is the model of the speedy R.A.F. launch depicted at the top of this page. The actual vessel itself is the Thornycroft Range Safety Launch, used on R.A.F. bombing ranges. These launches, which patrol the range area to keep stray vessels from possible danger, have two 200-h.p. Thornycroft diesel marine engines and cruise at 20 knots.

The Hornby model of this fine craft is 10 inches long with a beam of 3 inches. Like all the new models in this range, it is fitted with a powerful clockwork motor which will enable the launch to travel up to 140 feet at one winding. These motors are precision made, and should not need replacement. Even so, the model craft have been so designed that the motors are replaceable.

Coming into the shops about the same time as the R.A.F. Range Safety Launch will be another model of a Thornycroft

Here is the Hornby model of the R.A.F. launch on the opposite page. You will see that, like its prototype, it carries R.A.F. roundels and the number 1640 on the bows.

The PL1 fast patrol boat in model form. This Hornby speed boat, like the vessel on which it is based, carries a forward cabin and a rear cockpit.

This river launch, with twin cockpits, has a neat screen in front of the driver's seat.

prototype, the PL1 fast patrol boat. The actual craft is 39 feet 6 inches long, with a speed of 17 knots.

The Hornby duplicate of this graceful boat is 10½ inches long with the same beam as the R.A.F. launch. It has a white plastic hull, with bright red and white superstructures. This will be No. 4 in the new range. Also planned for production in the near future is a third Hornby launch, the twin cockpit river launch. This represents a type of vessel which may be seen on rivers up and down the country in the summer months. It has a neat steering wheel in the forward cockpit, and is finished with cream decking, bright red hull and blue seats. This model is No. 3 in the series and, like the two others referred to, is fitted with a strong and reliable clockwork motor.

All the models have brass propellers and adjustable brass rudders. You see the three new models illustrated above.

BOOK REVIEW

"RAILWAYS IN NEW ZEALAND"

By A. N. Palmer

This pleasant little book forms the newest addition to the "Pageant of New Zealand" series published by A. H. and A. W. Reed, of Wellington, N.Z., and its author is Publicity Officer for the New Zealand Railways. It presents briefly the history of railways in that country, and deals also with present-day practice; and it is illustrated with many well-detailed sketches and drawings. The New Zealand Government Railways are well to the fore on modern practices and motive power and the reader will realise that the railways are a valuable asset to the country.

Copies can be obtained in Great Britain from Bailey Bros. and Swinfen Ltd., Hyde House, West Central Street, London, W.C.1. The price is 7/– including postage.

The de Havilland Beaver No. A95-203 referred to on this page, snowed over on the Antarctic plateau. R.A.A.F. official photograph.

Air News

Battle with a Blizzard

By
John W. R. Taylor

ALTHOUGH it is Summer here in England, teams of international explorers and scientists in the Antarctic are now experiencing the coldest Winter weather on earth. Their aircraft are moored outdoors, waiting for flying to start again in the southern Spring. The picture above gives a good idea of how the aircraft will look when the time comes to dig them out of the snow.

The exciting story behind this particular photograph of de Havilland Beaver No. A95-203 became known recently when an Australian team returned home from the frozen South.

December 28, 1959, began as a normal day, with a wind speed of "only" 40 m.p.h. By the time Squadron-Leader Jim Sandercock, leader of the R.A.A.F. Antarctic Flight, and his colleagues arrived by Snow Weasel to inspect their Beavers on an ice plateau at Mawson, the wind had increased to more than 80 m.p.h. Aircraft No. 201 had frayed through its steel mooring cables and was slithering towards a cliff. Sandercock immediately ran to it, climbed aboard, started the engine and taxied it gingerly back up the slope.

Smashed to Pieces

Before it could be tied down, Beaver No. 203 also broke loose and started to move towards the cliff. Sandercock's two mechanics chased after it with a tractor and managed eventually to pin it down. While they were doing so, the pilot had to stay in No. 201, trying to hold it steady with the rudder and with the engine roaring at full power. His battle lasted for an hour and 50 minutes, with the aircraft hovering stationary most of the time, a few inches above the ground, in the teeth of the blizzard. At last, with great courage, the ground crew succeeded in tethering it, and Sandercock was able to stop the engine and join the others in the shelter of a nearby caravan.

Alas, their efforts were in vain. The wind, still increasing in intensity, wrenched both machines free of their cables and smashed them to pieces.

Getting Nowhere Quickly

Airlines carry some strange cargoes in their flying freighters, but B.O.A.C. personnel had good reason to look surprised when they were asked to transport some empty cardboard boxes thousands of miles and then bring them back again. The customer

explained that the boxes were of a new type, designed to combine light weight with great strength, and that he simply wanted to find out how they would stand up to conditions experienced on a long journey.

The boxes emerged from their travels with flying colours; so did two experimental shipments of orchids which B.O.A.C. freight experts sent on a complete round-the-world flight, to test their reactions to long, high-speed journeys. The orchids began their trip in Singapore and flew by Comet to London, thence across the Atlantic to New York and San Francisco, and back to Singapore via Tokyo and Hong Kong. Both consignments arrived back at their starting point in perfect condition.

Dodging Defences

According to the French Press, the R.A.F.'s Vulcan and Victor bombers are being fitted with a revolutionary electronic device known as the Carcinotron which can jam every type of radar and radio and make detection of the aircraft almost impossible.

The device was developed originally by French scientists and will presumably be fitted to other NATO attack aircraft. Its use will greatly extend the useful life of piloted bombers, especially as it will jam the guidance systems of most types of ground-to-air guided missiles. This bears out what many experts have believed to be true for years—that there is no substitute for a human brain and eyes, and that piloted aircraft of some kind or other will always be needed for attack and defence.

25-minute Ocean Hops?

The Russian space scientist Ari Sternfeld believes it may not be many years before giant rockets are used for passenger carrying instead of for warlike purposes. Unlike present-day ballistic missiles, which are boosted to great speeds during their first moments of flight, he says the rocket-ships will gather speed gradually, so that the passengers will experience no discomfort. Journey time from Moscow to London will be 15 minutes, and a transatlantic hop from London to New York will take a further 25 minutes.

"Operation Blue Tar"

When the U.S. Navy wanted to test the capabilities of its missile-firing fighters at night and under unfavourable weather conditions, it asked the Royal Canadian Air Force to help. The result was "Operation Blue Tar", in which Ryan KDA-4 Firebee jet target drones were launched from Canadian Lancasters to act as targets for the Raytheon Sparrow III homing missiles carried by the American interceptors.

The tests were made from the R.C.A.F. station at Cold Lake, Alberta, during snowstorms, and in some cases in heavy sleet, with temperatures ranging from 12 to 15 degrees below zero. They proved not only the effectiveness of the 12-ft. long 1,500 m.p.h. Sparrow III, but the reliability of the little Firebees, which achieved 100 per cent. reliability after launching, in spite of the weather.

Picked Up Loads in Mid-air

In tests over Sussex County Airport, Delaware, U.S.A., on April 7, five small packages were dropped by parachute from a lightplane at a height of about 8,000 feet. A Sikorsky S-55 helicopter whirled in above each parachute in turn and snagged its shroud lines with a special recovery hook suspended under its fuselage. The chutes, streaming behind the helicopter, were then delivered one at a time to a predetermined spot on the ground.

Picking up by helicopter a load suspended from a descending parachute. Here a Sikorsky S-55 snags the parachute shroud lines on a special hook at the end of a 20 ft. boom.

It was the first time anyone had tried picking up, by helicopter, a load suspended from a descending parachute, and it was completely successful. U.S. military leaders who watched the show said it opened up new possibilities for the recovery, intact, of small, pilotless target aircraft and guided reconnaissance missiles after they have completed their flights and have opened their recovery chute, so that it will be possible to use them again and again. The recoveries were made at heights between 1,000 and 6,000 feet.

Greek Comet Breaks Record

Not so fast as Mr. Ari Sternfeld's rockets, but still fast enough to break records, was the first de Havilland Comet 4B jet-liner delivered to Olympic Airways of Greece on April 30. Piloted by Captain P. Ioannidis, it flew from London to Athens, via the south of Italy, in 3 hr. 13 min. 57 sec., setting up an official city-to-city record.

Following recent orders, the number of Comet 4s ordered or delivered now totals 50, made up of 19 for B.O.A.C., nine for B.E.A., six for Aerolineas Argentinas, two for East African Airways, four for Olympic Airways, three for Mexicana Airlines, three for Misrair of Egypt and four for Middle East Airlines. All will be in service by early 1961.

For "Two" Read "Four"

Powered originally by two Orpheus turbojets, the prototype Lockheed JetStar is now flying with four of the new 3,000 lb.-thrust Pratt & Whitney JT-12s. As can be seen in the illustration on this page, these are mounted in pairs on each side of the rear fuselage. They give considerably more power than the former engines, and the JetStar will cruise at up to 550 m.p.h. when carrying eight passengers in the "business plane" role.

Several other improvements have been made. Each undercarriage unit is now fitted with twin wheels instead of the original single wheels. A high-lift wing leading-edge and thrust reversers have been added to enable the JetStar to operate from small airfields. External fuel tanks, on the wings, are now standard equipment, giving a range of up to 2,900 miles.

The first production JetStar is scheduled to fly this month, with initial deliveries to customers planned for next January. In addition to the civilian machines, it is expected that the U.S.A.F. will use JetStars as bombardier and navigator trainers.

A Nine-ton "Spare"

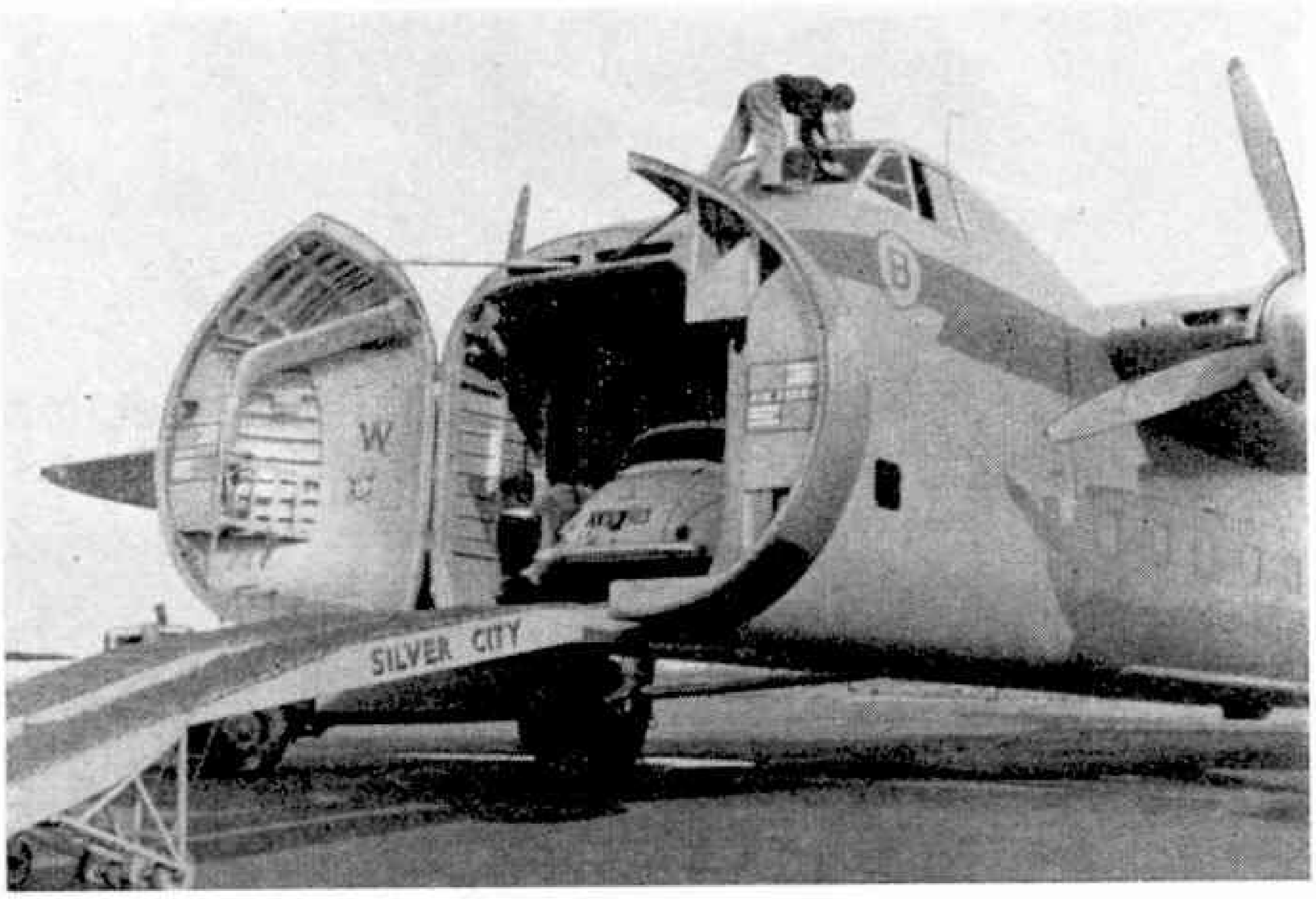
A freight-plane belonging to Seaboard & Western Airlines, U.S.A., came to the rescue of one of its sea-going sisters a few weeks ago, with the result that the ship's operators were spared the expense of keeping the vessel and her crew idle in New York for twelve to fifteen days.

While leaving her berth, bound for Canada, the 11,085-ton freighter *City of Manchester* suffered a broken propeller shaft. The owners, Messrs. Ellerman and Bucknall, had a replacement shaft in England; the problem was to get it across the Atlantic quickly, for it weighed nearly nine tons and was 16 feet long. Seaboard & Western were asked if they could handle the giant-size package. They could, and eleven hours after leaving London the shaft was in the airlines' terminal at New York International Airport, on its way to the shipyard to which the crippled ship had been moved.

The prototype Lockheed JetStar now has four engines, mounted in pairs on each side of the rear fuselage. One pair is shown in this picture.

MECCANO MAGAZINE

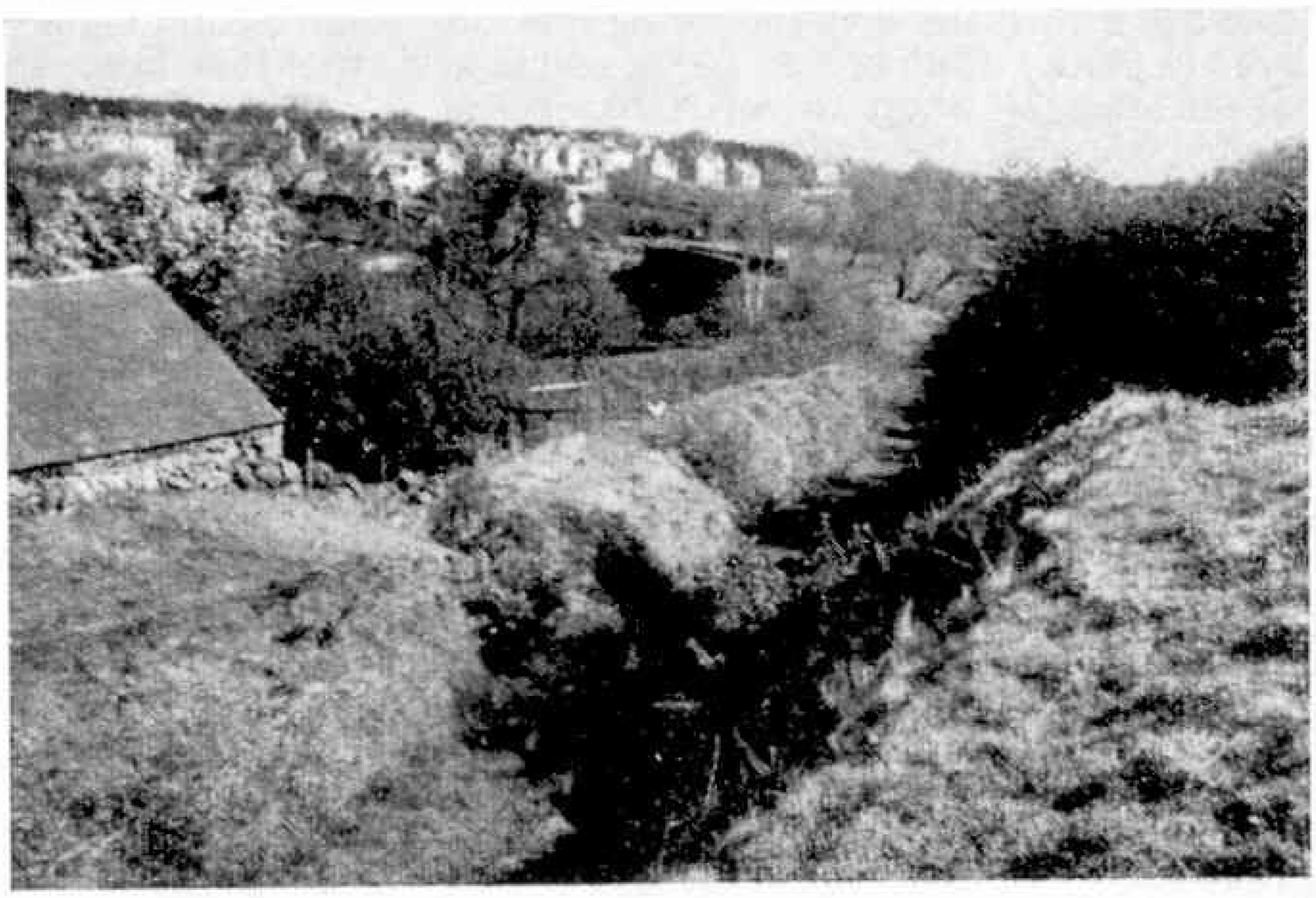
EIGHT-PAGE
Junior Section



Window cleaner with a most unusual job: This maintenance man at Lydd Airport has to clamber over the aircraft in order to clean the windows of the cockpit. Mr. V. A. Broadhurst of Wilmslow sent us this photograph.

WHERE ONCE A RAILWAY RAN

In July 1951 the *Meccano Magazine* carried an interesting article recording the closure of the Ballycastle Railway. Since that time, the track has been dismantled and removed and now the station at Ballycastle is used by buses. One section of the former railway has been re-made as a road to serve the Ballycastle Forest, but the remainder of the line has become heavily overgrown. The photograph on the right shows the cutting, bridge and locomotive shed at Ballycastle. This is the curve the runaway train negotiated safely!
Picture: David Richmond, Birmingham.



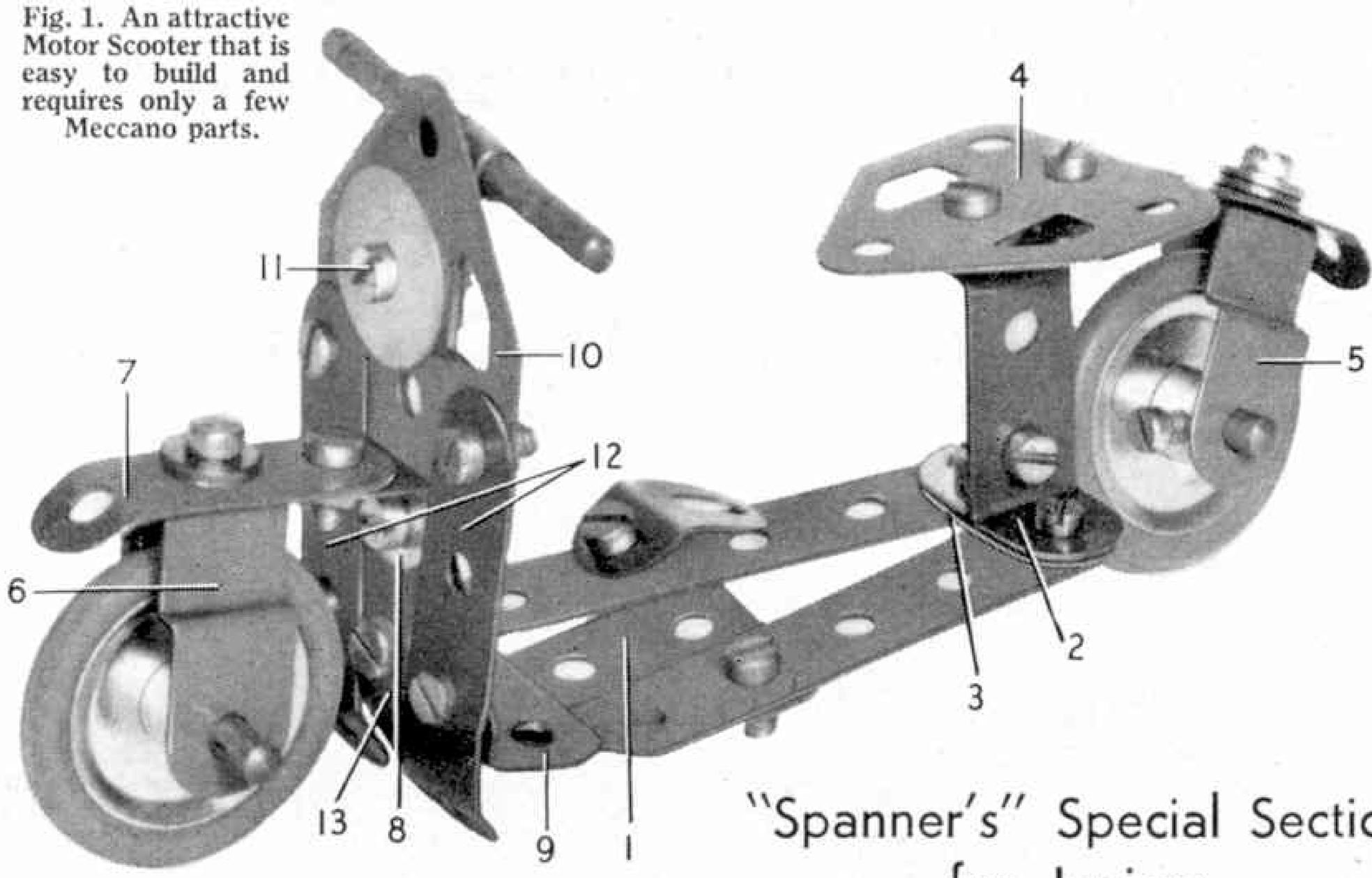


Fig. 1. An attractive Motor Scooter that is easy to build and requires only a few Meccano parts.

"Spanner's" Special Section for Juniors

Easy Model-Building

Motor Scooter

The attractive model Motor Scooter shown in Fig. 1 can be built from very few parts and it is best to begin construction by taking a Flat Trunnion 1 and bolting to its end holes two 2½″ Strips through their second holes. A 1″ Reversed Angle Bracket 2 is then fixed in the end hole of one of the two 2½″ Strips, the bolt also being used to hold in place a Fishplate 3. In the end hole of the other 2½″ Strip, an Angle Bracket is bolted through its elongated hole. This Angle Bracket and Reversed Angle Bracket 2 are then bolted together.

The saddle is a Flat Trunnion 4, bolted through its centre hole to the lug of the Reversed Angle Bracket 2. To the rear of the Flat Trunnion 4 a 2″ Strip is bolted by its end hole, the parts being spaced apart by two Washers. The Strip is bent to slope downwards, and has a Stepped Bent Strip 5 bolted to it, which carries a 1″ Pulley Wheel and Rubber Ring on a 1″ Axle Rod.

The front wheel is mounted similarly to the rear wheel in a Stepped Bent Strip 6, which is bolted to the centre hole of a 1½″ Strip 7. A bolt in the end hole of Strip 7 passes through the elongated hole of an Angle Bracket 8. The Bracket is fixed to a Flat Trunnion 10 by a Bolt 11, which also passes through the centre hole of a 2½″ Strip 8 and the apex hole of Trunnion 9. A Flat Trunnion 10 is bolted to an end hole of the 2½″ Strip by a Bolt 11 that also holds a ¾″ Washer in place. This Washer represents the headlight and is spaced from the Flat Trunnion 10 by two small Washers. This same Bolt 11 also carries a Right-Angle Rod and Strip Connector, in which is fixed a 2″ Rod that forms the handlebar.

Two 2″ Strips 12 are used to form the leg-shields, and they are bent under slightly at their end holes, as in the case of the 2½″ Strip 13. This is to prevent any mud and water thrown up by the front wheel from splashing the rider.

Parts required to build the Motor Scooter: 3 of No. 5; 3 of No. 6; 1 of No. 6a; 1 of No. 10; 2 of No. 12; 1 of No. 12c; 1 of No. 17; 2 of No. 18b; 2 of No. 22; 19 of No. 37a; 17 of No. 37b; 1 of No. 38; 1 of No. 38d; 2 of No. 44; 1 of No. 111c; 1 of No. 124; 1 of No. 126; 3 of No. 126a; 2 of No. 155; 1 of No. 212a.

Roman Chariot

The attractive model of a Roman Chariot drawn by two horses, and shown in Figs. 2 and 3, is designed so that it can be built from parts in Outfit No. 3.

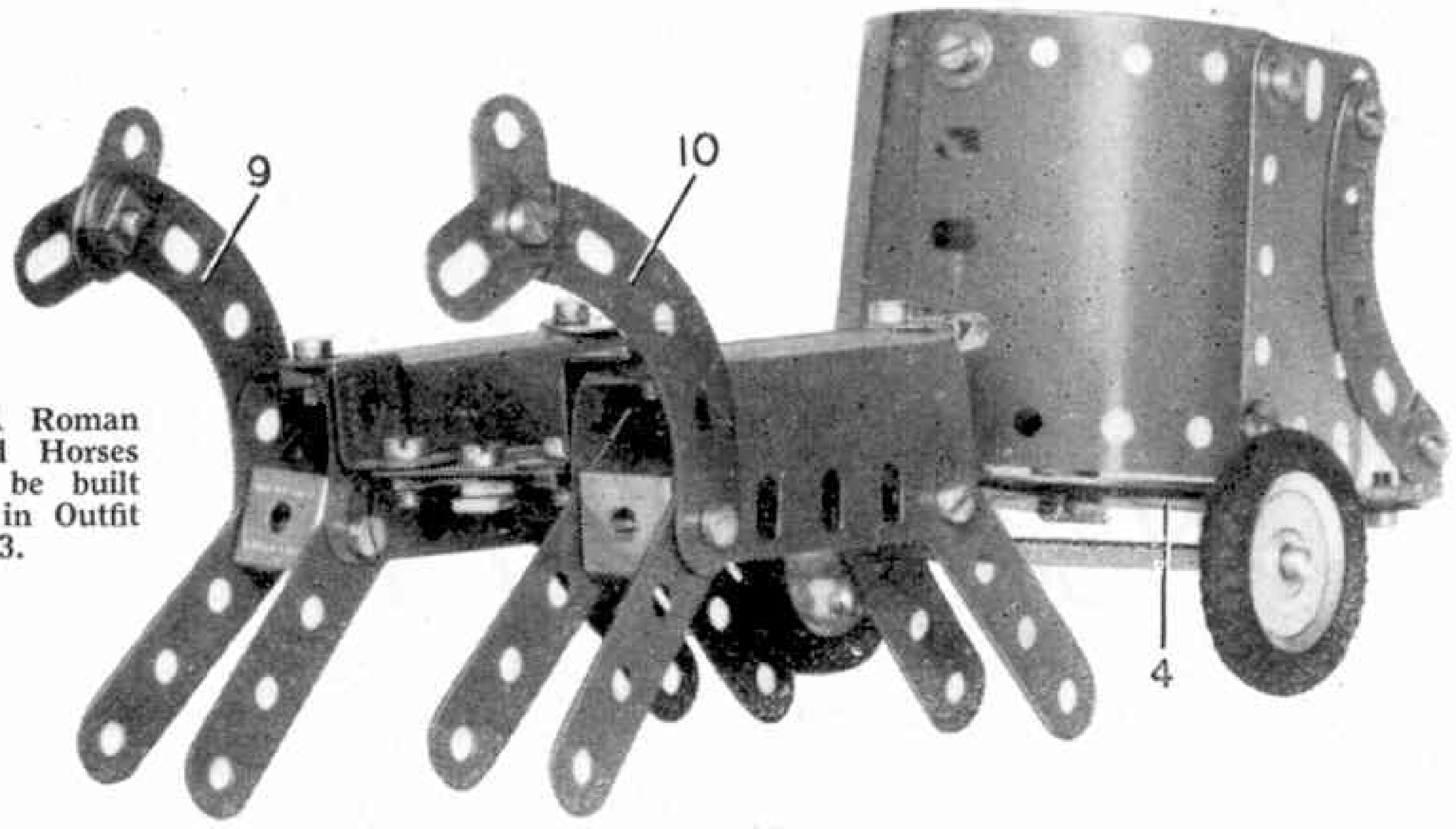


Fig. 2. A Roman Chariot and Horses which can be built from parts in Outfit No. 3.

The chariot itself is built up on a base consisting of a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate with a $2\frac{1}{2}''$ Strip bolted across its rear end, and a $2\frac{1}{2}''$ Semi-Circular Plate 2. These two Plates overlap each other by one row of holes, and two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 3 and 4 are bolted one on each side of the overlap, with their lugs projecting away from the Plates. Through the lugs of Double Angle Strip 2 a $3\frac{1}{2}''$ Rod is passed, which carries at each end a 1" Pulley Wheel with Tyre to form the wheels of the chariot. To the lugs of the Double Angle Strip 4 the sides and front of the chariot are bolted. Each side is made with a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate, and these overlap a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Curved Plate by one row of holes, both of the Plates being bolted to a lug of Double Angle Strip 4. The two $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Curved Flexible Plates at each side curve around the front, overlapping each other by one row of holes, and they are bolted to an Angle Bracket 5 fixed to the Semi-Circular Plate 2. An Angle Bracket is fixed to each of the two rear corners of Flexible Plate 1, and one end of a $2\frac{1}{2}''$ Stepped Curved Strip is bolted to each of these. The other ends of the Curved Strips are bolted to the corners of the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates that form the sides of the chariot.

A $5\frac{1}{2}''$ Strip 6 forms the shaft to which the horses are attached. This Strip is bolted by one of its end holes to the centre hole of Double Angle Strip 3, and it is also bolted to Semi-Circular Plate 2. The other end of the Strip is lock-nutted to a Flat Trunnion 7. A Reversed Angle Bracket is bolted to each corner of Trunnion 7 and the horses are attached to these.

The two horses are constructed alike, except that the tail of the right-hand horse is formed from a Fishplate, while that on the left has a tail made from a Rod and Strip Connector. The bodies of the horses are formed from U-Section Flexible Plates 8, each of which has four $2\frac{1}{2}''$ Strips bolted to its corners to represent the legs. The front corners of the U-Section Curved Plates 8 are connected together by two Double Brackets, and at the rear corners by four Angle Brackets, bolted in pairs through

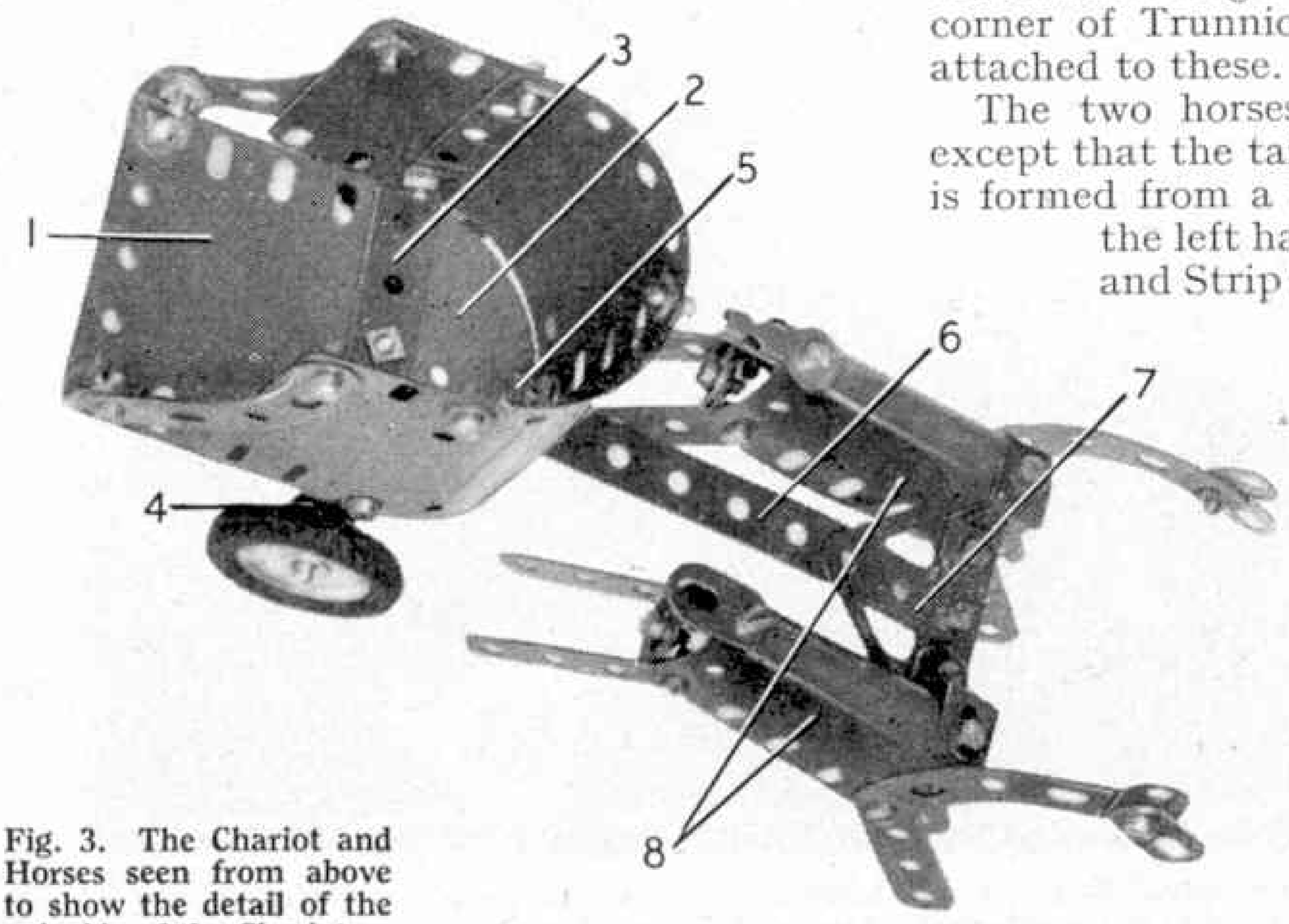


Fig. 3. The Chariot and Horses seen from above to show the detail of the inside of the Chariot.

(*Continued on page 373*)

DINKY TOYS NEWS

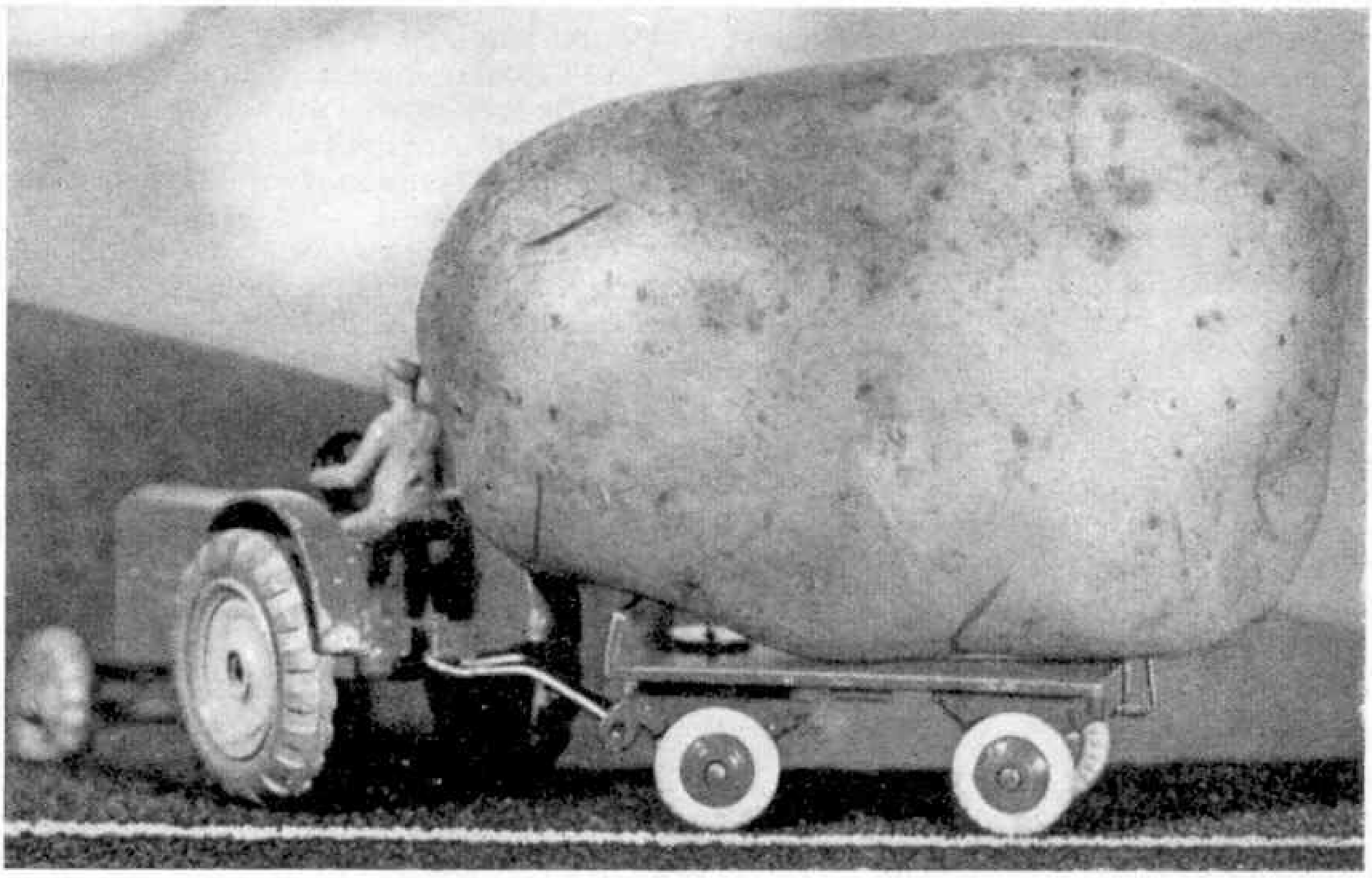
By THE TOYMAN

Sand Schemes Can Bring You Holiday Joy

WITH summertime at its height, now is the time to go "operational" out of doors with your Dinky Toys models. This month's headline gives you a hint of what I have in mind as I write these notes, and the pictures on page 350 show you what can be achieved by using miniature cars and lorries out of doors.

I had many letters during the winter from youngsters who found great enjoyment in outdoor schemes. I visualise these hardy youngsters as the sort who love the open spaces and have tousled, windswept hair. But there must be many young enthusiasts, of course, who prefer to have the gentle sun beating down on them and a rich green lawn, or a wide stretch of pleasant sand to play on and I am sure they would find great fun in trying out some of the schemes illustrated this month. The fly-over bridge which is our top picture on page 350 is, I think, very effective and should be quite simple to achieve on firm sand. It has the modern flavour about it and offers scope for the use of almost any Dinky Toys model you possess.

Another attractive scheme is shown in the centre picture, where a lorry laden with sand travels along a mountain road. This idea could be extended by building the tortuous sort of road covered by those adventurous drivers who take part in the Monte Carlo Rally. Finally, at the foot of the same page is the sort of layout which



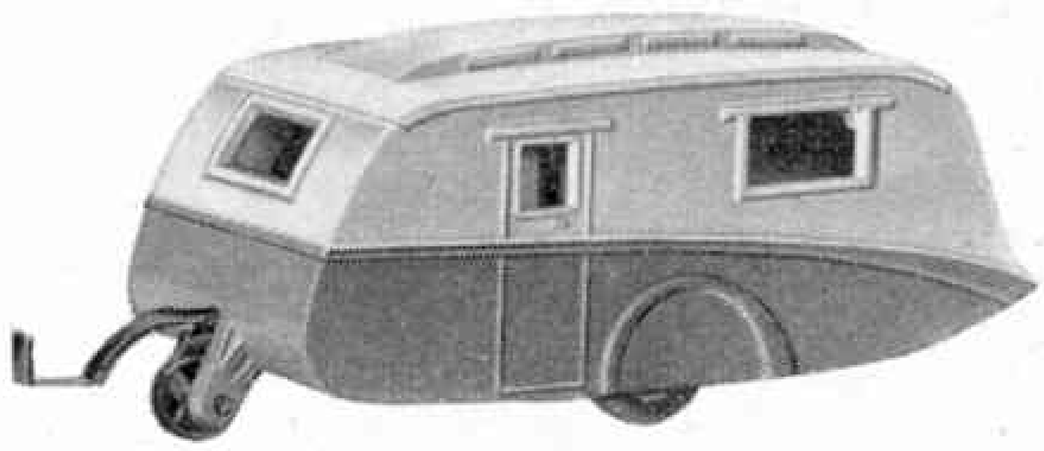
Potato on a tractor. This illustration comes from Alabama, a famous potato-growing district, and a caption across the foot of the actual post card says, "They grow 'em big here."

appeals to all kinds of youngsters—a castle has been built with bucket and spade and the towers provided with realistic-looking turrets. As you can see, the castle is under attack. No defenders are in sight and one must assume from this that they are simply lying low! I am sure some of you will want to try these open-air schemes during the next few weeks, and if you take any photographs of them, I will be very pleased to see them.

And now I want to draw your attention to the most unusual picture at the bottom of page 348. It has been sent to me by a Dinky Toys enthusiast who lives in America, and forms one side of a coloured post card. It shows a massive potato mounted on a Dinky Toys Tractor and Trailer and gives a good idea of the sort of unusual load these models have been asked to carry. Sender of the post card is John H. Edwards of Mobile, Alabama, who tells me he has been collecting Dinky Toys since 1932 and that his array of models includes every Dinky Toy ever made, with about half a dozen exceptions.

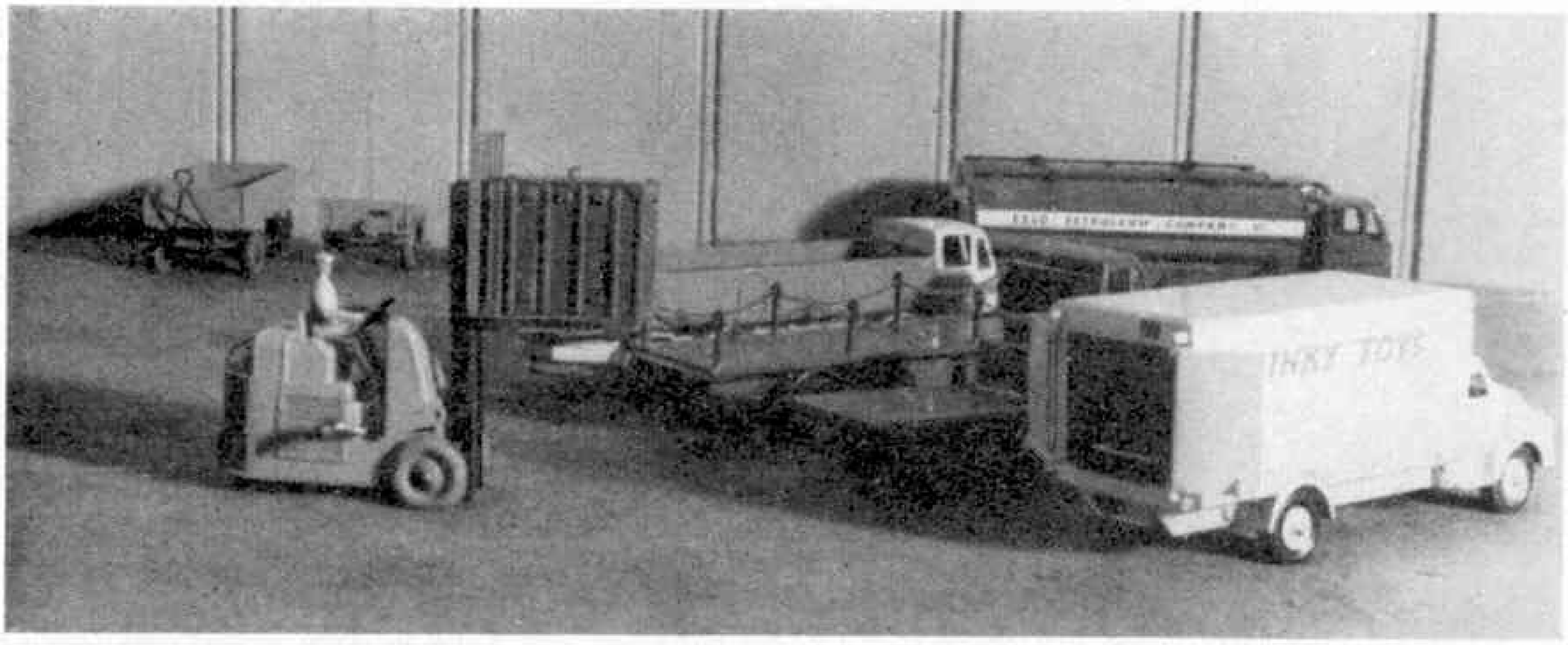
"I have", he writes, "the original models with solid metal wheels (a truck, van, sports car and sports saloon). With some duplicates I have at the moment 1,300 models, including variations in colour, which have been collected from England, France, Germany, Switzerland, Portugal, Canada, U.S.A., Eire, New Zealand and Australia."

DINKY RHYMES



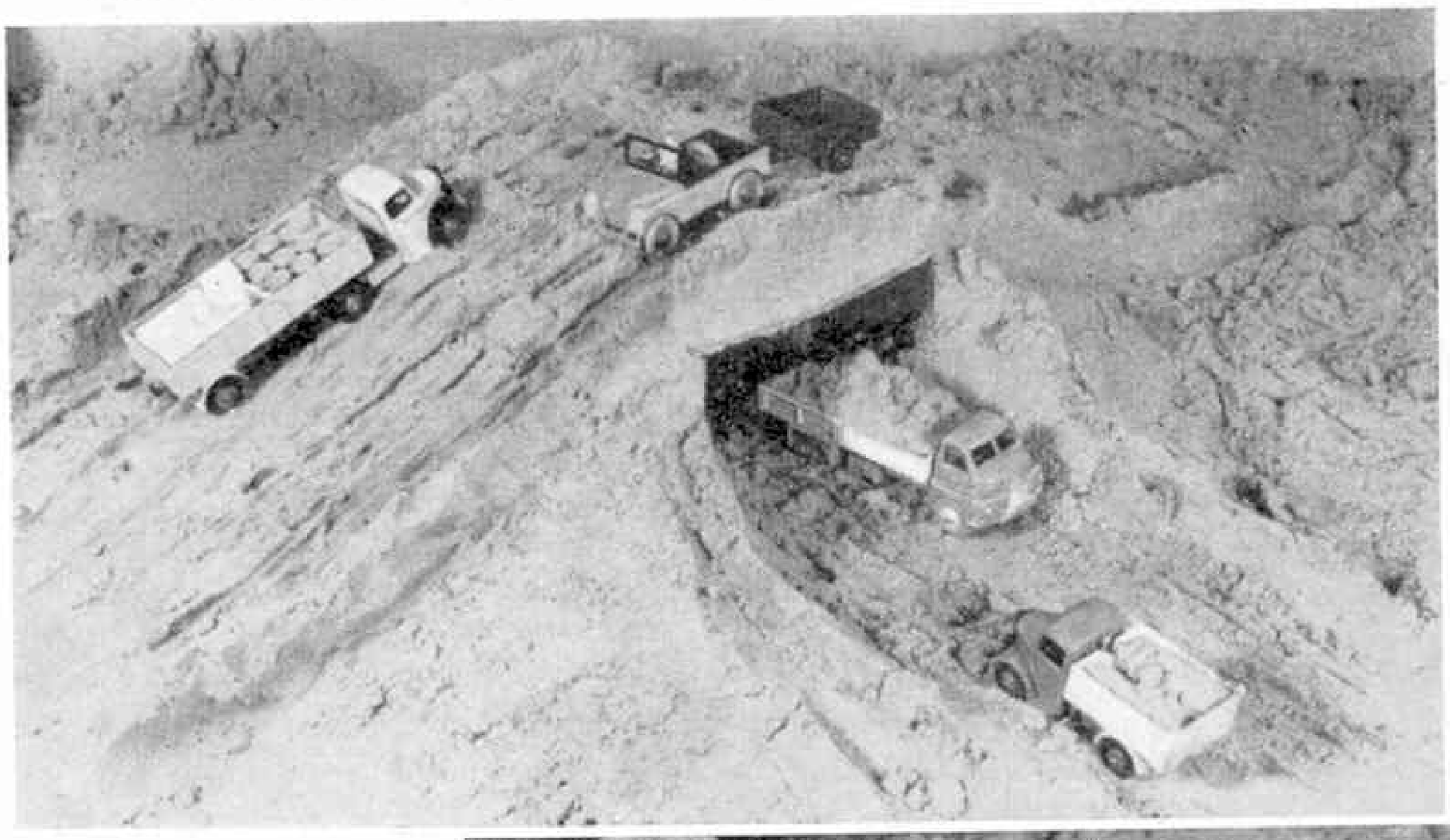
Behind saloons it's gaily whirled,
By young hands it is tested;
In "camping grounds" throughout the world
This caravan has rested.

A reader overseas—S. Moore, whose address is with the British Forces abroad—is seen here with his Dinky Toys layout.

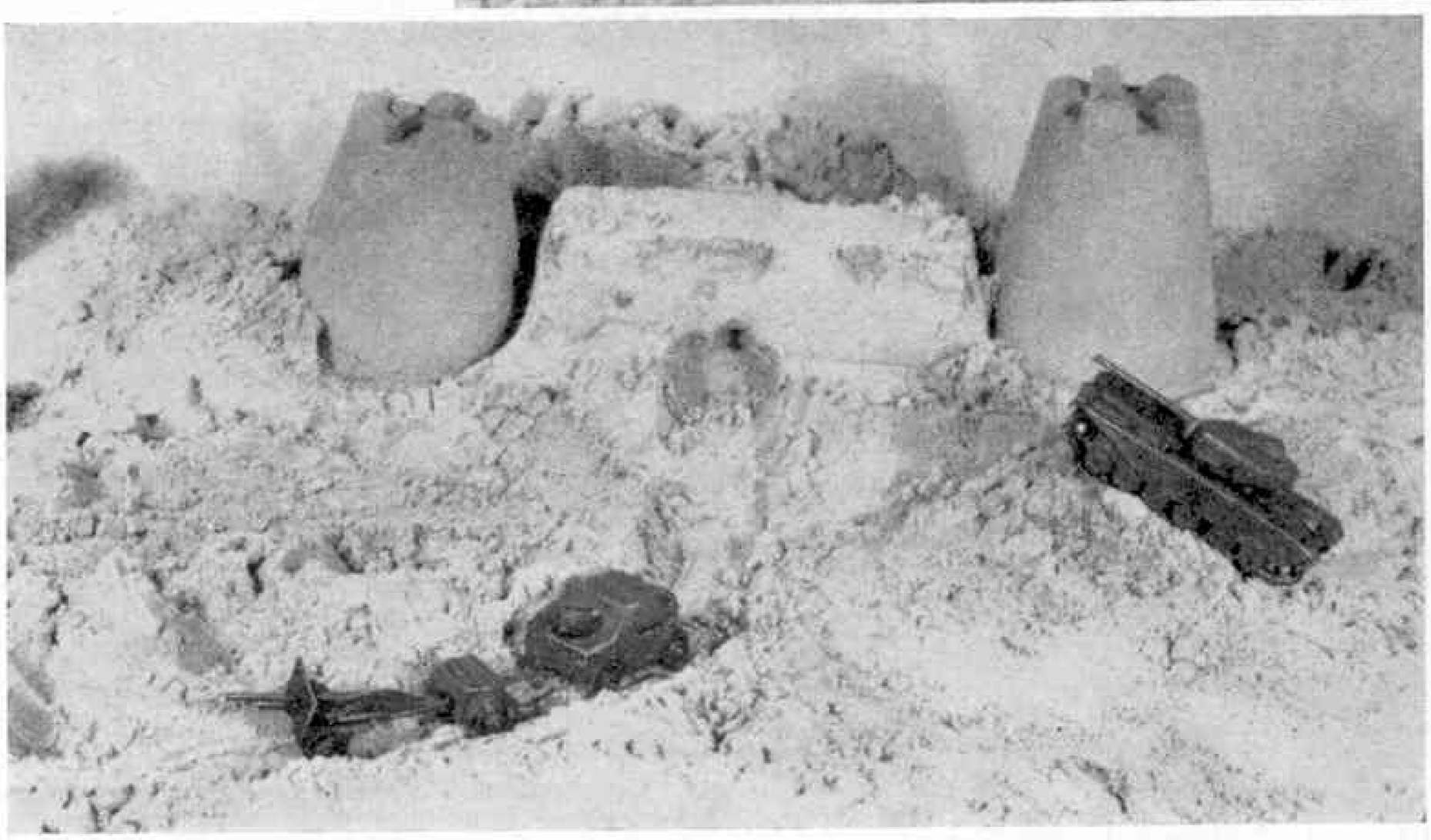


Realism in loading achieved by D. A. Barnes of London. Excellent use has been made of the Dinky Toys Fork Lift Truck and the Bedford Pallet-Jekta Van.

BESIDE THE SEASIDE . . . .



Dinky Toys schemes on the summer sands: (Above) A fly-over bridge in the modern style with Dinky Toys models completing a realistic scene. (Right) A loaded wagon takes the mountain road, and (below) a battle on the shore. Dinky Toys armoured vehicles attack a castle made in sand.



"Tommy Dodd" writes about:

Richard (left) and Neville Sleigh, of Churchdown, have a fine home-built tunnel that they use with their Hornby railway, here shown in use in the garden.

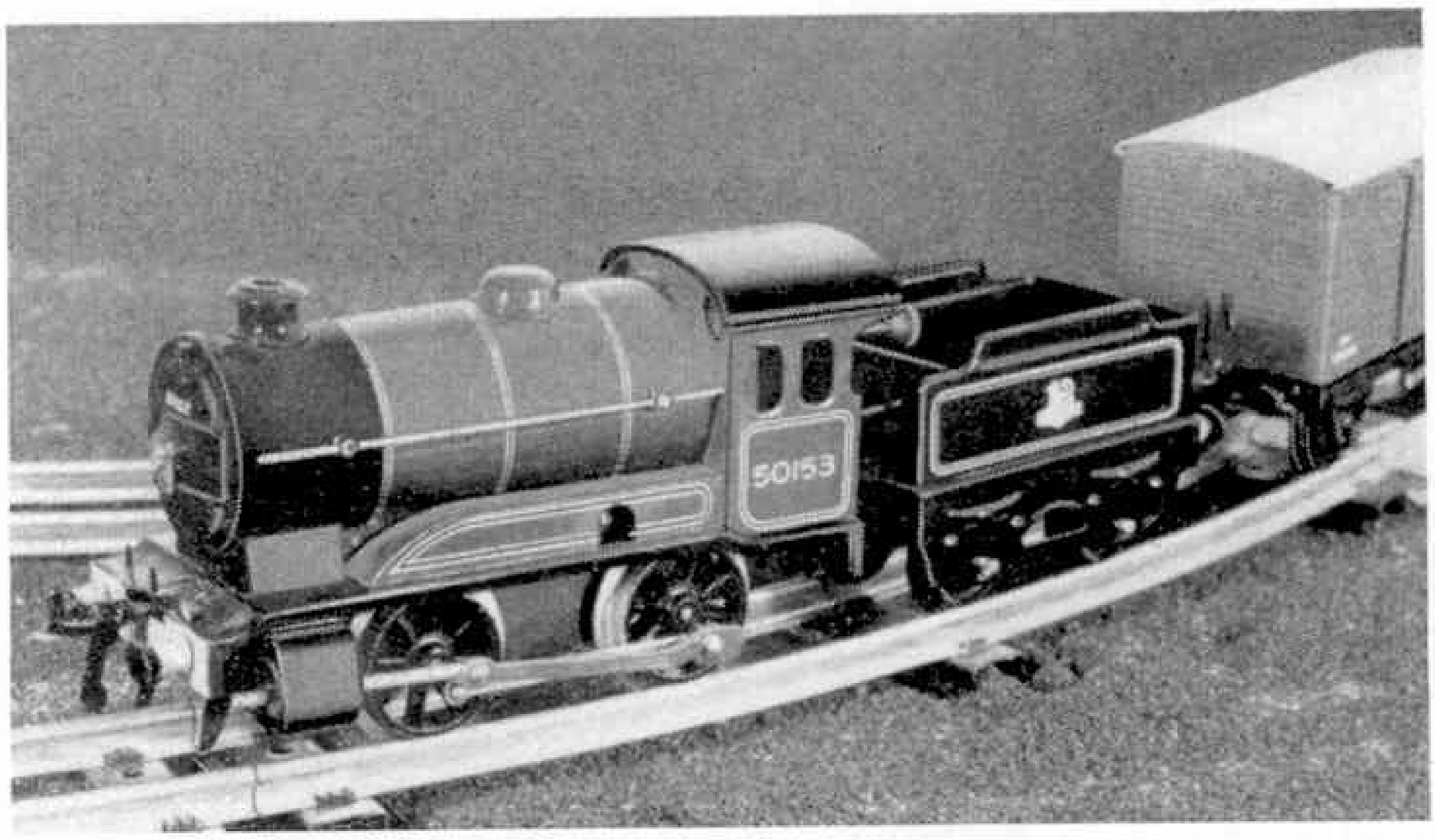
A Fine Home-Built Tunnel

LAST month, you will remember, I said I hoped shortly to show you some photographs of outdoor layouts. My first photograph this month concerns a system of this nature run by the enthusiasts shown in the picture. They are Richard and Neville Sleigh, of Churchdown (Gloucester), and you will probably recall the description of their railway which was published in the January "*M.M.*". It is clear that the system is not only an indoor affair, but that it is also used successfully out of doors on suitable occasions during the summer months. The fact that it could be readily used in this way as required was one of the advantages that caused the Hornby Clockwork System to be adopted by the Sleigh family.

Another point is that our friends do not keep to the same plan every time that they have the railway set out for running, but different layouts are arranged according to their changing ideas from time to time. When a railway is to be used out of doors in this way it saves time if the track plan has already been decided, because the rails can be arranged without delay and train running can begin fairly quickly. If you have no settled idea of the layout you are going to assemble you will find that you may spend a good deal of the day just arranging things, and the train running programme will suffer as a result.

As you know, many of the lineside items on the railway that we have been talking about have been built up at home and I know that you will be interested in the really splendid tunnel shown above. This is a robust ribbed structure, so strong that it can stand the weight of a grown-up on top of it! The built up framework is of wood, covered with suitable material, treated with glue and painted. The tunnel ends have been modelled to represent brick construction and I am sure that you will be attracted by the handsome towers and the tall arched entrance. A good point, which adds to the strength of the tunnel as a whole, is the inclusion of what are known as wing walls, that is the walls that usually slope up to a tunnel face. You must have noticed such things on many occasions on your railway journeys.

I am not sure whether our friends took part in the construction of the tunnel. Probably they did a certain amount, but in any case they and their father are certainly to be congratulated on the realistic result obtained. The tunnel is readily movable and unlike many miniature tunnels it is of reasonable length and is arranged for placing on a curve, so you cannot see straight through it. See how dark it looks inside, in the picture. Of course, in the photograph there is a train coming through. It simply would not do to photograph a tunnel without a train emerging from it.



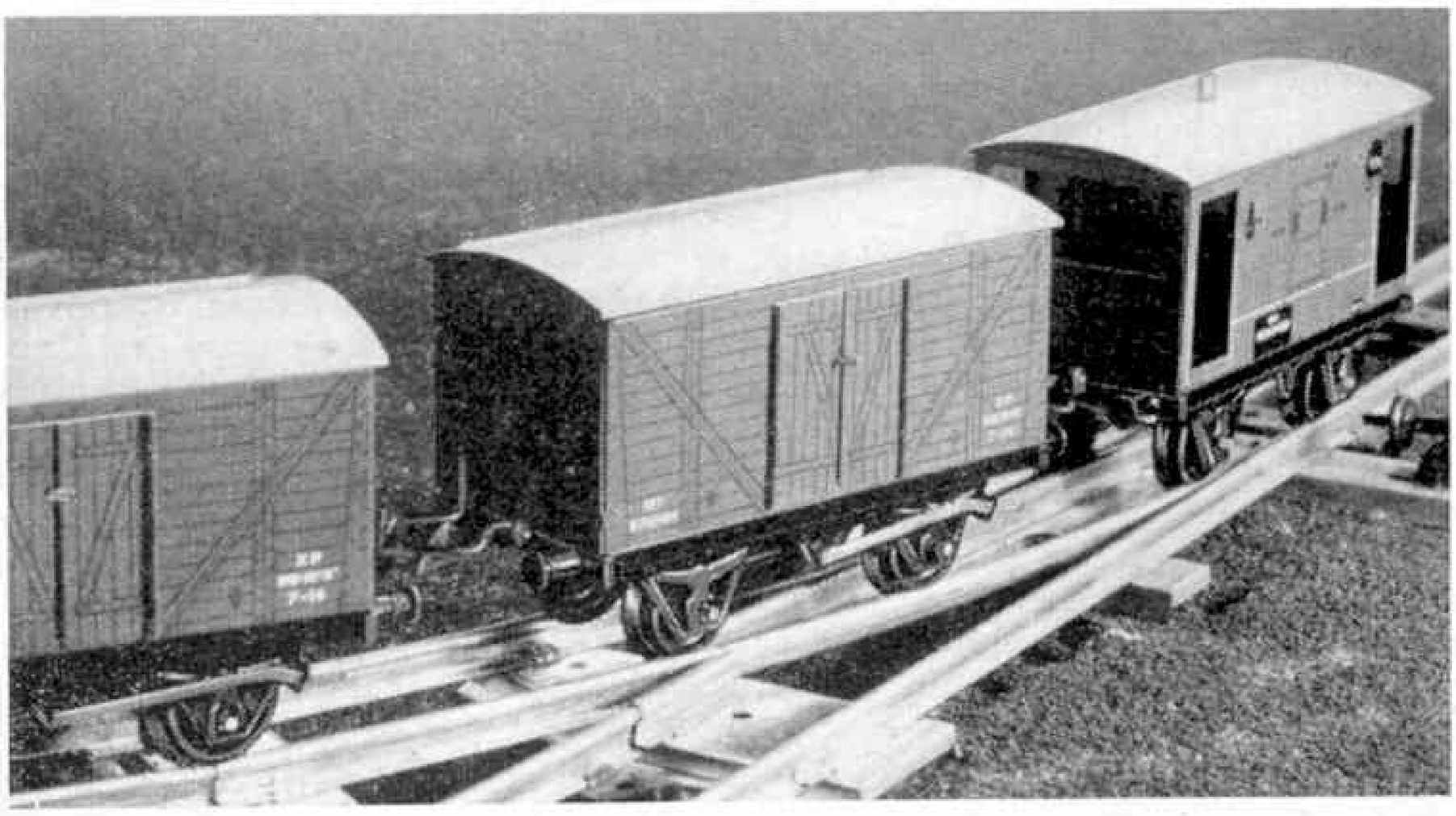
This Hornby No. 51 Locomotive has just backed on to its train and will soon be ready for a good run along the main line.

The train is a mixed freight, and there is plenty of variety in the rolling stock employed on the line.

In this respect other Hornby railway owners can readily follow the example of our friends from Churchdown, because the Hornby Gauge 0 system includes plenty of goods vehicles for you to choose from in making up your trains. But, apart from some variety, you should aim at having several vehicles of similar kinds so that fast freight trains for particular traffics can be run. Apart from those that operate in daytime, overnight freight services form an important part of B.R. activities. You will not wish to imitate literally the overnight part of the business, but there is every reason in favour of including one or two fast freight trains conveying Vans or Containers perhaps in your train running programme.

In the upper picture on this page a Hornby No. 51 locomotive has just backed on to a train, the tail lamp being still in position on the engine front. Soon it will be replaced by two headlamps, in the appropriate positions according to the class of train, when the train will be ready to go. If you do not know the headlamp code you can look it up on page 12 of your H.R.C. booklet. For a train consisting entirely of No. 50 Vans you would be quite in order in placing one headlamp on the centre lamp bracket over the buffer beam and the other over the right hand buffer looking forward.

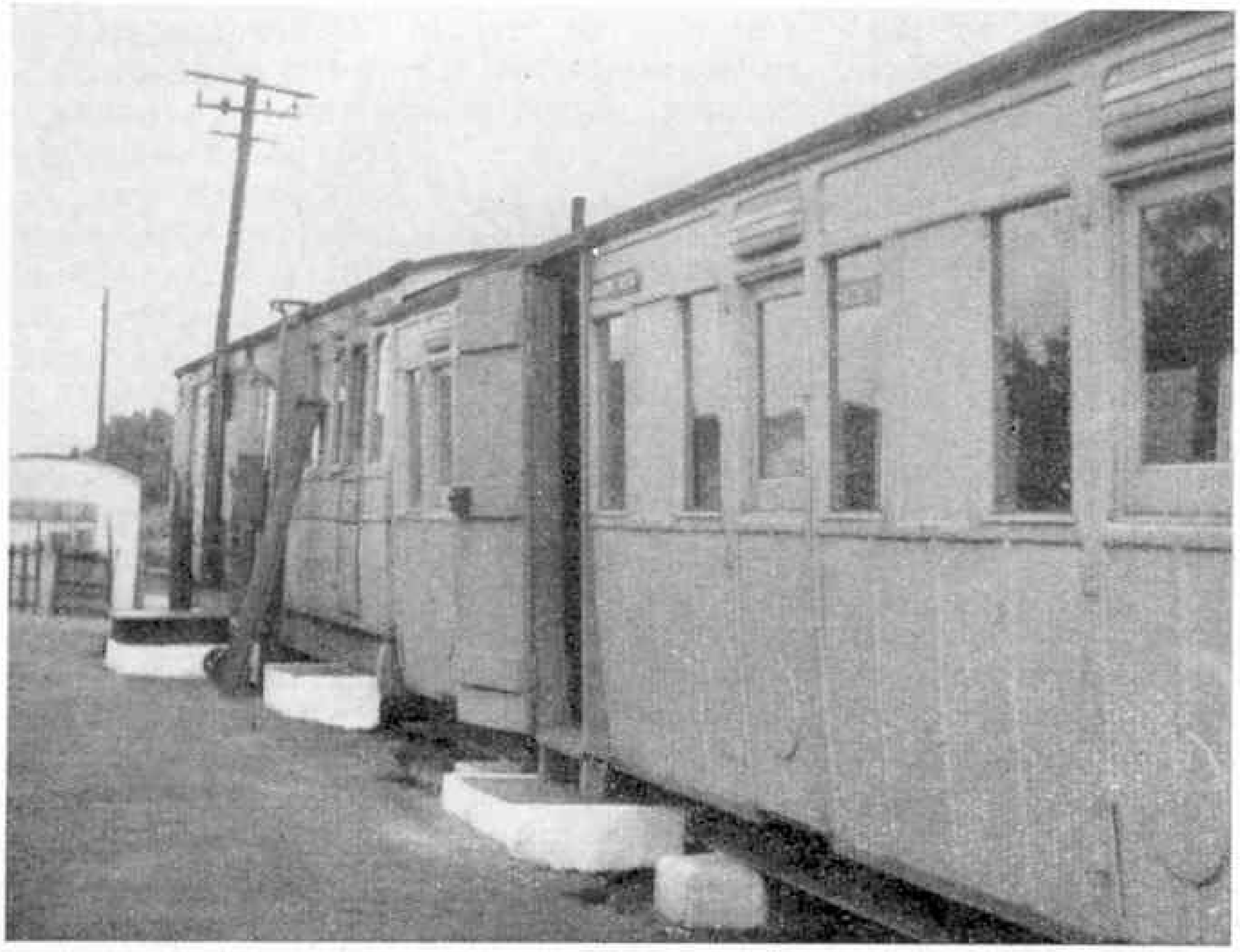
Just to complete the tale I am showing you a rear end view of the train concerned, as it goes on its way. The No. 50 Goods Brake Van is correctly behind the line of Vans and you can see one of the side lamps in position, so I think that we are safe in assuming that the other is in place and that the back end of the Van displays the tail lamp to indicate that the train is complete.



Over the Points comes the rear end of a Hornby fast freight train, with a No. 50 Goods Brake Van right at the tail.

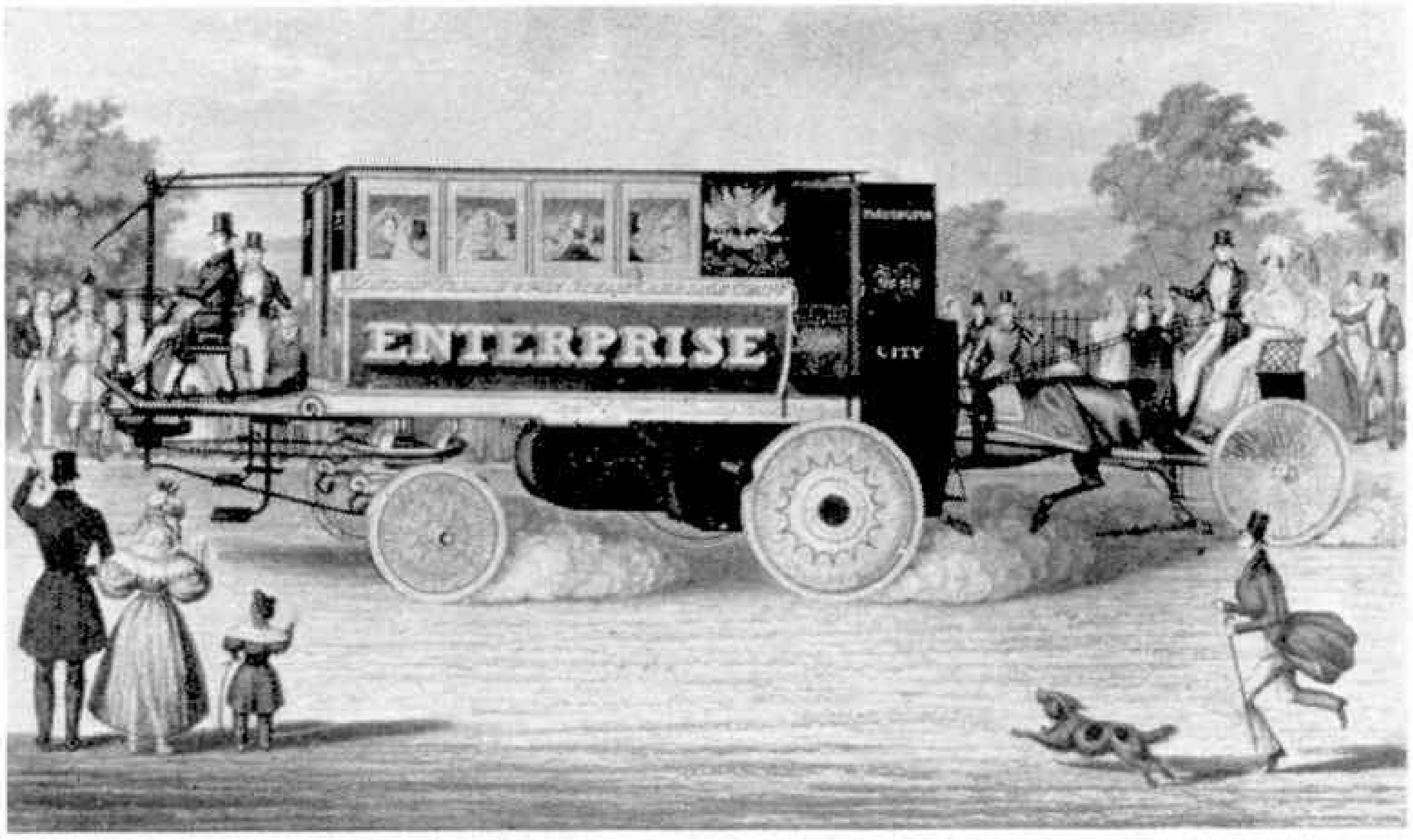
Of General Interest

Readers of the *Meccano Magazine* will remember the description in the March issue of the liner *Oriana*, the biggest passenger liner ever launched in England, and the largest British liner to be built since before the war. Following the launch of the *Oriana* at Barrow-in-Furness late last year, the task of transporting the four giant boilers to to the fitting-out berth presented many difficulties, but all were successfully overcome. Each boiler weighs 132 tons and is 26 ft. high, 29 ft. long and 20 ft. wide. Here you see a photograph of one of the boilers being conveyed by a 40-ton special carriage. The picture is reproduced by courtesy of *Vickers News*.



These carriage bodies at Thorpeness railway halt, Suffolk, constitute a waiting room, office and goods shed and according to British Railways they have probably been in position for about 45 years. The carriages appear to be old G.E.R. six-wheeled coaches made prior to 1914. The waiting room apparently was a four-compartment first or second class carriage, the office and goods shed a third class five-compartment vehicle. The photograph is by V. A. Broadhurst, of Wilmslow, Cheshire.

DAYS OF THE STEAM-CAR CRAZE



By MAURICE SCHOFIELD, M.A., B.Sc.

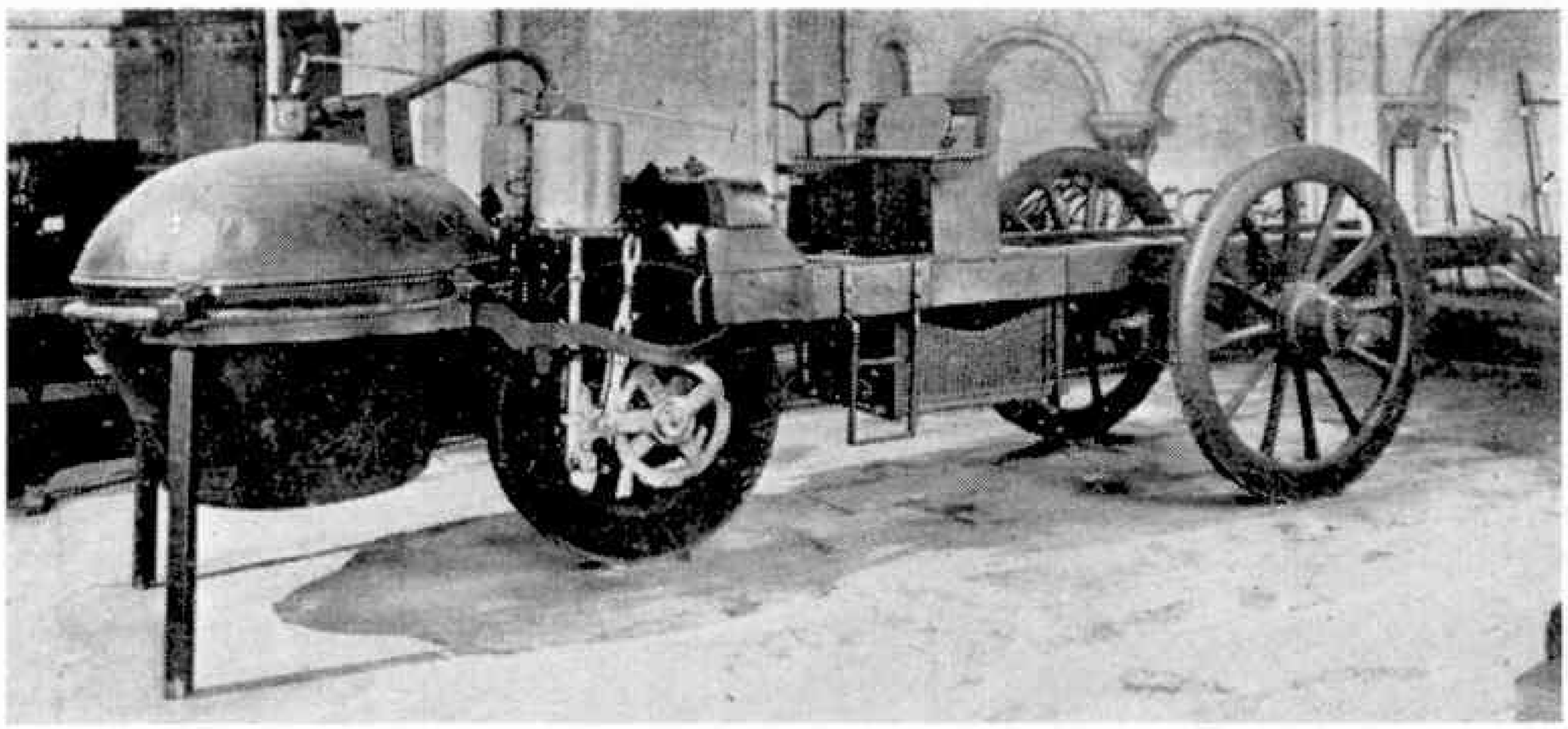
IF it were possible to run a London to Brighton race for old steam-cars instead of "old crocks", then this year would be the time to stage the race. For it is just 100 years since the last British steam-car of note puffed its way along the street, while, in the same year, Thomas Aveling's traction-engine chugged along the roads in its place.

This double anniversary is remarkable in that America only woke up to the steam-car craze after British pioneers rebelled against the Man with the Red Flag by turning to traction-engines and then to the steam-roller. Although the authorities controlling our roads in 1860 were convinced that a steam-car going more than 4 m.p.h. was dangerous, their worries began all over again when the steam-roller ground its way ahead against all protests that it would crush drains and might get out of control!

Hancock's Omnibus Enterprise, shown above, was built for the London and Paddington Steam Carriage Company in the hey-day of the steam-car craze. Photo., Science Museum, London.

The prelude to the steam-car saga opened in France when Nicolas Cugnot built a clumsy steam-tricycle with iron tyres, a 3-h.p. engine, and two cylinders. Cugnot had the idea of mechanising artillery with his steam vehicle constructed at the Paris arsenal in the reign of Louis XV; yet France missed this first effort to replace horse-drawn guns, and instead there developed Cugnot's modified car which carried three or four passengers. It had rack and pinion steering and later was to inspire young Rudolf Diesel to begin engine-making when he saw it in a museum. Yet the car never attracted full support from the government. It required twenty minutes' rest after twenty minutes' running to regain steam-pressure; it overturned when trying too great a lock in turning, and it roused the Paris police to clap poor Cugnot into gaol when his car collapsed in the street and was considered "unroadworthy"–the first use of that word!

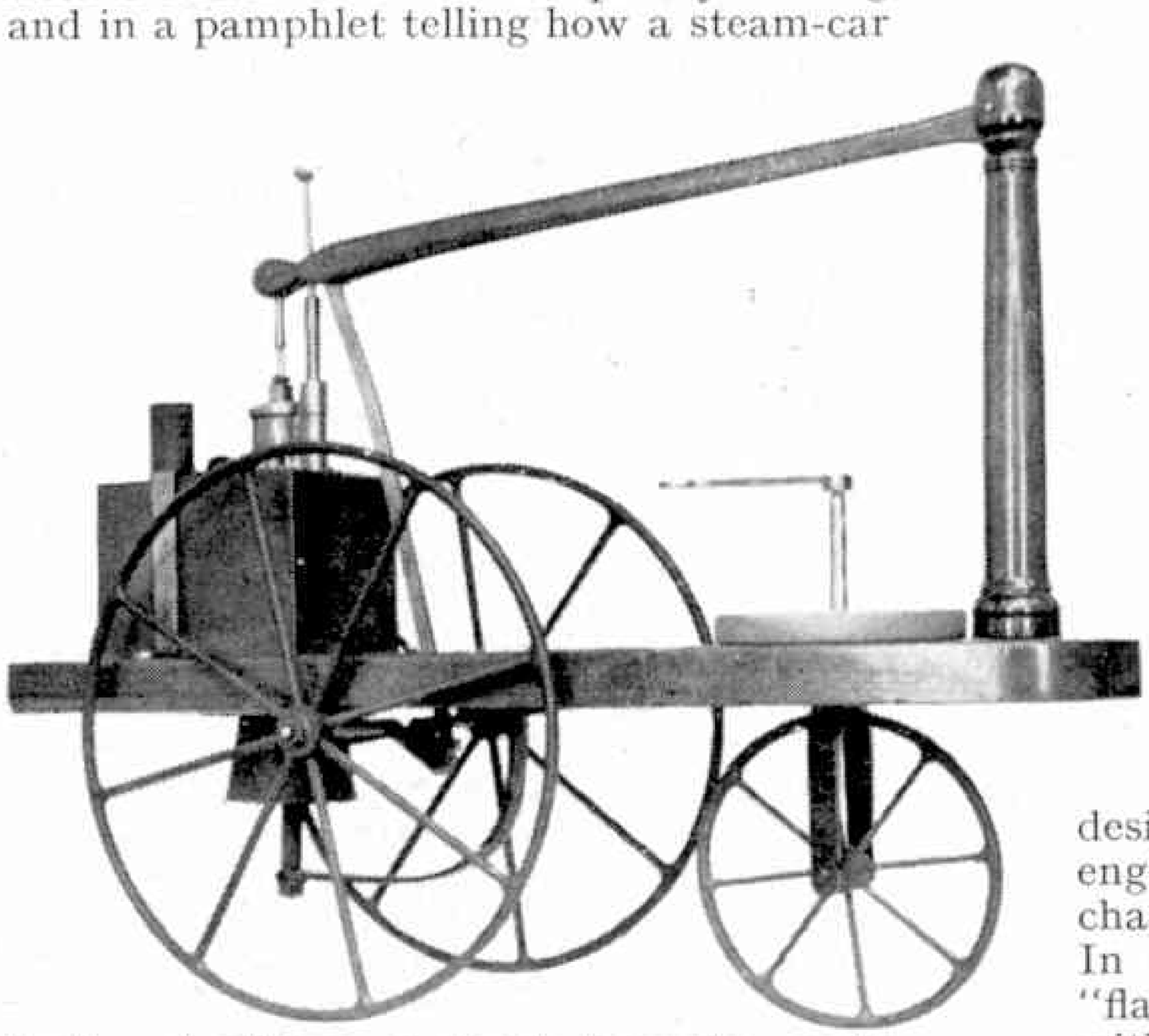
As with other ideas first toyed with in France, it was only when British engineers took up the steam-car theme that things literally got moving. William Murdock, towards the end of the eighteenth century, was the first in the field with his steam-tricycle, yet, as with his invention of gas-lighting while at Redruth, Cornwall, he was handicapped by the jealousy of James Watt who employed him. His steam-car, although more of a model, had proved its possibilities in running around Redruth and even in scaring the vicar by night when Murdock ran it along the church avenue. If



Cugnot's locomotive, built in France (1770). Photo., Science Museum, London.

only Watt had applied his selector-gear or variable speed-gear and encouraged Murdock, the steam-car would have been successful much earlier than the 1800's.

Murdock was a member of the Lunar Society, a club of Midland scientists whom Matthew Boulton's butler called "the Lunaticks". Among the members was Dr. Erasmus Darwin who championed the idea of steam-cars with his poetry-making and in a pamphlet telling how a steam-car



Replica of William Murdock's locomotive model (1786). Photograph, Crown copyright, Science Museum, London.

must be able to start and stop quickly, must bear in bulk or weight a low ratio to the power, together with other essentials. Yet, in spite of the genius of Murdock, Watt and other Midland scientists, the aversion of Watt to use high steam-pressure engines put a brake—if the metaphor may be permitted—on any development.

From Cornwall there also came a second enthusiast in Richard Trevithick. He built, at Camborne, a first vehicle with a spring safety-valve, a boiler-feed pump and with a single cylinder with the piston driven via a cross-head. This steam-carriage was destroyed by fire when the party in charge were consuming "drinks and roast goose". Yet, it encouraged Trevithick to put on the road his London Steam Carriage with a boiler mounted at the rear, and fitted with 10 ft. diameter road wheels since the rough roads of that period made small wheels useless.

The steam-carriage made journeys from Paddington to Isleworth but, strangely, attracted little attention from the Press despite such incidents as when it broke through garden railings, causing the owner to shout, "What is that thing?"

In the British chapter in steam-car history, there now came many pioneers who tried out all manner of variations in design. There were twin-cylinder engines with water-tube boilers and a chassis built by the famous Bramah. In 1824, Burstall and Hill tried a "flash-type" boiler in a steam-car with four-wheel drive. The front axle was geared to the rear driven by a two-cylinder engine, and the vehicle carried a six-ton load at 4 m.p.h. (thus anticipating the traction type carrying heavier loads).

In 1829 William James, of Holborn, devised a separate twin-cylinder engine for each rear wheel, the steam being turned on to each cylinder via valves. In cornering, one engine worked faster while the "inner" one was throttled down. The James steam-coach carried fifteen passengers at 15 m.p.h.,

having a total weight of three tons caused mainly by two boilers four and a half feet in length.

From 1830 to 1860 there came a highlight in steam-car history with enthusiasts out to develop regular transport services both in London and between various towns. The versatile Walter Hancock was one, with his steam-buses such as the "*Autopsy*" and the "*Era*" (with its 18-passenger accommodation).

Hancock carried over 12,000 passengers and built the "*Enterprise*" for a London company. Yet his much-publicised activities must not overshadow those of others who were more concerned with trying out further engineering ideas. Even the three-wheeler had not been abandoned, as witness the car of Summers and Ogle with coke-fired boiler and fan for forced draught. Although this model broke down, the passengers finishing their journey on (but not in) the canal, a second type carried nineteen passengers for long journeys.

All such pioneers got little or no support from the government. When Sir Goldsworthy Gurney designed a forced-draught model, a parliamentary committee proposed a grant of £16,000 which came to nought despite the rhyme:

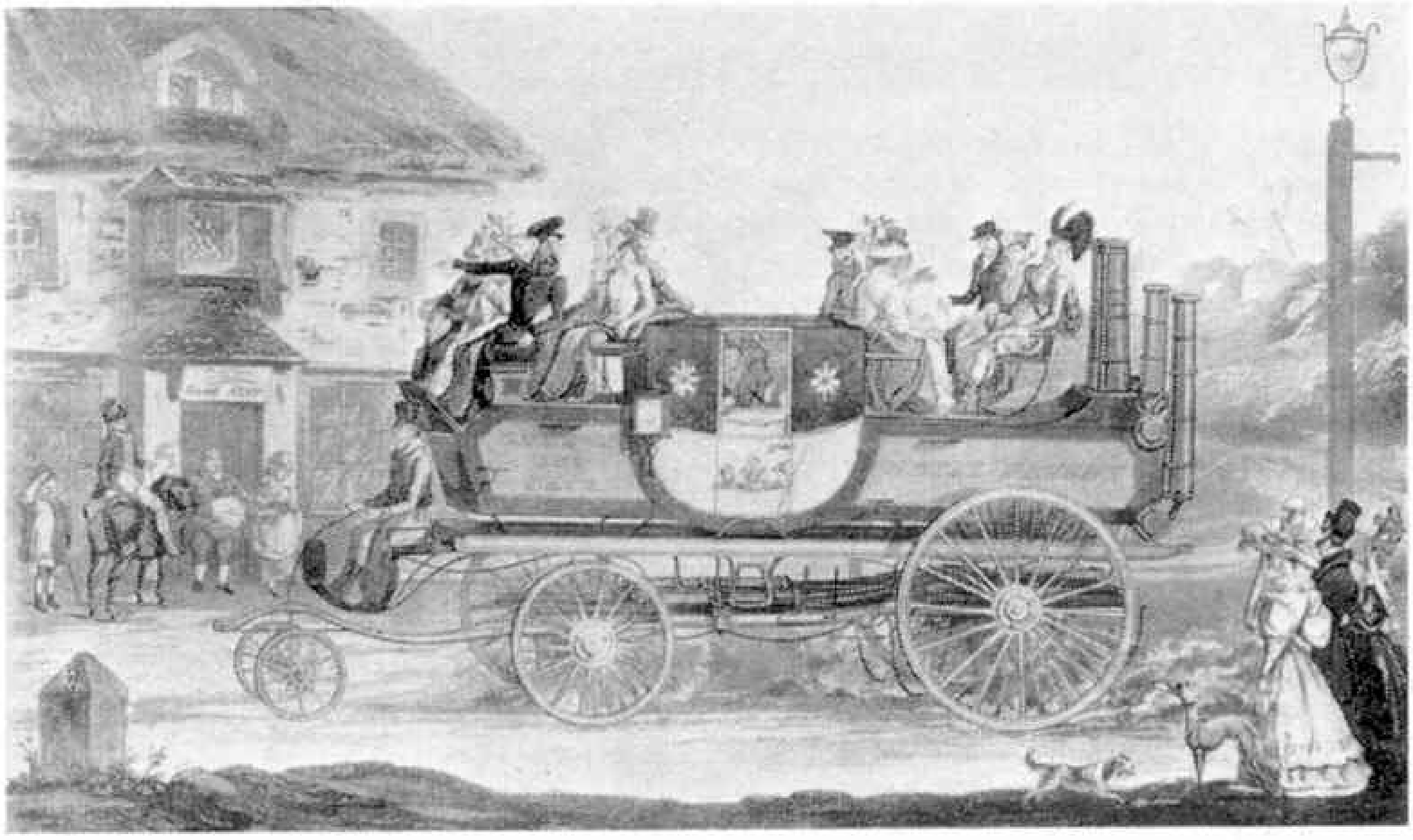
Instead of journeys, people now
May go upon a Gurney
With steam to do the horses' work
By power of attorney.

The Turnpike Act of 1840 brought a heavy tax on such vehicles and the Locomotive Act later imposed a speed limit of 5 m.p.h. in built-up areas and 10 m.p.h. elsewhere. The Man with the Red Flag put the finishing touch to further developments just as Thomas Ricketts brought the steam-car to its zenith with his first-rate 1860 model.

Nevertheless, although American engineers took up where British designers left off, the year 1860 brought reward for all the practical efforts put into steam road-traction. Enter Thomas Aveling, one-time large-scale farmer who saw how agriculture needed steam-haulage. His first traction-engine, with improved chain gear and designed first to haul a threshing-machine, was shown at exhibitions, and later types at international exhibitions.

He used core-annealed steel for pins for chains of great durability, later introduced cast-steel gear, and showed how the single-cylinder engine of steam-car pioneers was sufficient even for a traction engine.

His first steam-roller brought further developments in steam-vehicles for roads rather than for railways, after initial opposition to such a monster had been overcome. Aveling certainly roused the people of Sittingbourne as he drove his 30-ton monster through the streets, causing horses to bolt and the local council to debate its coming, with predictions that it would destroy houses, kill children, crush drains and prove "an elephantine monstrosity". In the end, Aveling was honoured by engineering societies and by France with the Legion of Honour.



This print of Gurney's steam coach (1827) shows the engineer in front controlling the vehicle. The carriage was 15-20 feet in length and weighed about two tons. The rate of travel was intended to be from 8-10 miles an hour. Photo., Science Museum, London.

New Books for Railway Enthusiasts

The books reviewed on this page are published by Ian Allan Limited, and can be obtained from leading booksellers and railway bookstalls.

"TRAINS ILLUSTRATED SUMMER ANNUAL, 1960"

(Price 5/–)

This year's *Trains Illustrated Summer Annual* is up to the usual high standard, and contains a mixture of holiday and historical reading. There are ten chapters and features covering railways at home and on the European mainland. Commencing with a footplate journey on a "Princess" 4–6–2 of the L.M. Region, we next progress through Germany with C. Hamilton Ellis in his usual entertaining style. The Great Central line has been in the news lately, and Cecil J. Allen writes of its glory days, before and after the 1923 Grouping.

A photographic feature covering the Callander and Oban line brings home the scenic beauty of that route, as also does an article on the old Cambrian Railways Coast line to Pwllheli. The sad end of the County Donegal Railways Joint Committee as a railway concern is dealt with and brings a realisation of present trends, but the survival of the ancient Adams 4–4–2 tanks on the Axminster–Lyme Regis branch, covered by a photographic feature, offers the consolation that all is not yet dead so far as the past is concerned.

Other articles deal with the obscure L. & Y. R. 4–4–0 compound No. 1112, Great Central workings to Plymouth long ago, the Southern's Lymington Branch, Newmarket and its famous race traffic, and finally an exploration of the Flam-Myrdal Railway in Norway, a line of great scenic attraction. There are many illustrations.

"RAILWAY ROUNDABOUT"

Edited by
JOHN ADAMS and PAT WHITEHOUSE
(Price 6s. 6d.)

This is the book about one of the most popular and eagerly-awaited Television programmes featured by the B.B.C. Naturally, only a small selection could be presented in such a book, but those chosen are wide in variety and interest as well as being entertaining. First of all, Driver Hoole of East Coast fame deals with driving *"The Elizabethan"*. Next comes an expedition to the surviving Welsh narrow gauge railways by Bill Hartley. Photographing trains is then covered by John Adams, giving a number of useful hints, followed by railway society special trains by Pat Whitehouse.

Driving engines on the Romney, Hythe and Dymchurch Miniature Railway is described by Bill Hart, who makes it clear that driving is not the only job the men have to perform. Artist Terence Cuneo, whose graphic posters are familiar to all railway enthusiasts, entertainingly describes his adventures while surveying three of the best known bridges as a prelude to rendering them on his canvas. O. S. Nock deals with the Races to Scotland in the latter days of the last century and, as a vivid contrast, the amazing signal box at York is described by J. N. Stainthorpe, A.M.Inst.T. (Public Relations Assistant, North Eastern Region).

Steam and diesel in Donegal, by Arthur Curran, General Manager of the late County Donegal Railways Joint Committee, details the workings of Ireland's largest narrow gauge system, now unhappily closed. The stirring operation of two N.B.R. "Glen" 4–4–0s over the West Highland line specially for T.V. audiences is recalled by ex-driver Norman McKillop, and finally an epilogue by Peter Cranmer closes an entertaining and interesting book.

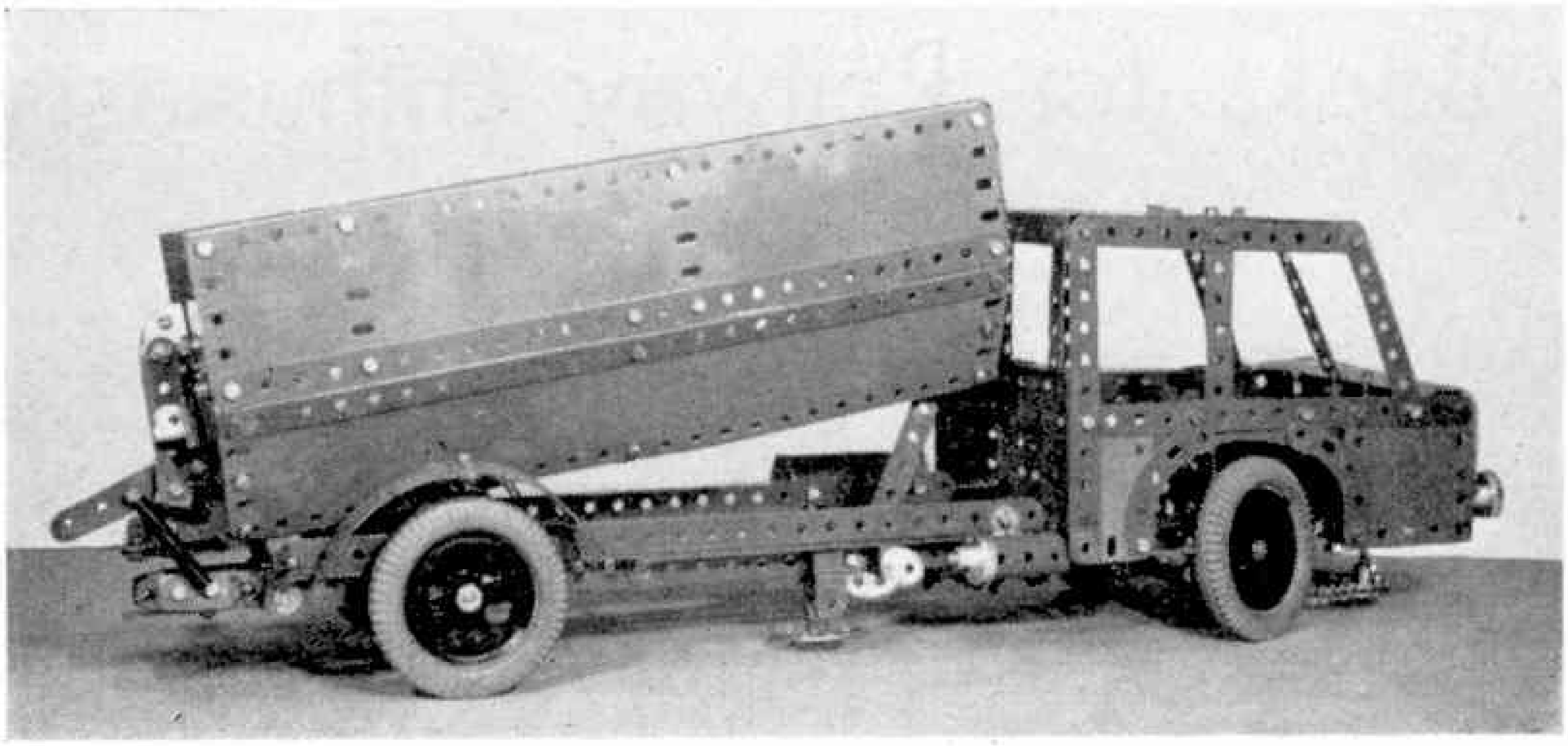
There are numerous half-tone illustrations as well as several colour plates.

"ABC RAILWAY QUIZ"

(Price 1s. 6d.)

For the entertainment and information it contains *ABC Railway Quiz* is really good value. Not only can the enthusiast test his knowledge by reference to the 275 questions and their answers, but the booklet is likely to prove of considerable use for quiz sessions organised by H.R.C. Branches, Meccano Clubs and similar organisations. The book is intended mainly for the youthful observer, but many of the older hands will be glad to refer to it.

The questions cover almost all aspects of railways, from motive power and rolling stock to signalling, the permanent way, general knowledge and history. *ABC Railway Quiz* can be carried with profit on your railway trips or outings as it provides the answers to quite a number of the things you would like to know about.



A model of a special Coal Lorry designed to fill and weigh sacks of coal automatically in the presence of the customer. It was built by C. J. Somerfield, London N.3

Notes and Ideas for Meccano Model-Builders

By "Spanner"

An Interesting Model Coal Lorry

The model coal lorry illustrated on this page was built by C. J. Somerfield, London N.3, and is based on a very interesting type of vehicle known as the Autobagger, introduced by Charrold Ltd., London. In building his model, Somerfield has tried to incorporate some of the main functions of the vehicle, which operates semi-automatically and is designed to load a weighed amount of coal into a sack in the presence of the customer. The actual vehicle was illustrated on page 505 of the October, 1957, *Meccano Magazine*.

The sequence of operations in the model is as follows. First the container is tipped and the chute cover moved away so that coal flows into the bucket of the machine. When the correct weight is in the bucket—and this is indicated by a pointer—the chute cover closes. Then the release lever is operated and the bucket is lowered so that the coal can be run off into a sack. Finally the container is lowered to its normal position, and the release lever falls back into place automatically.

A Useful Crane Grab

In Fig. 1 is shown a useful working grab that can be fitted to many kinds of model cranes. The grab jaws are constructed from 2½" Triangular Plates 1 edged at their bases by 2½" Curved Strips 2. The grab is raised or lowered by means of four lengths of cord 3, while another cord 4 passes round a 1" Pulley carried from the cross-piece 5. If both the cords 3 and 4 are hauled in or paid out at the same speed, the grab travels up or down without the jaws moving, but if one cord ceases to move the grab opens or closes according to the movement of the other cord. The joints marked "A" are all pivoted by means of

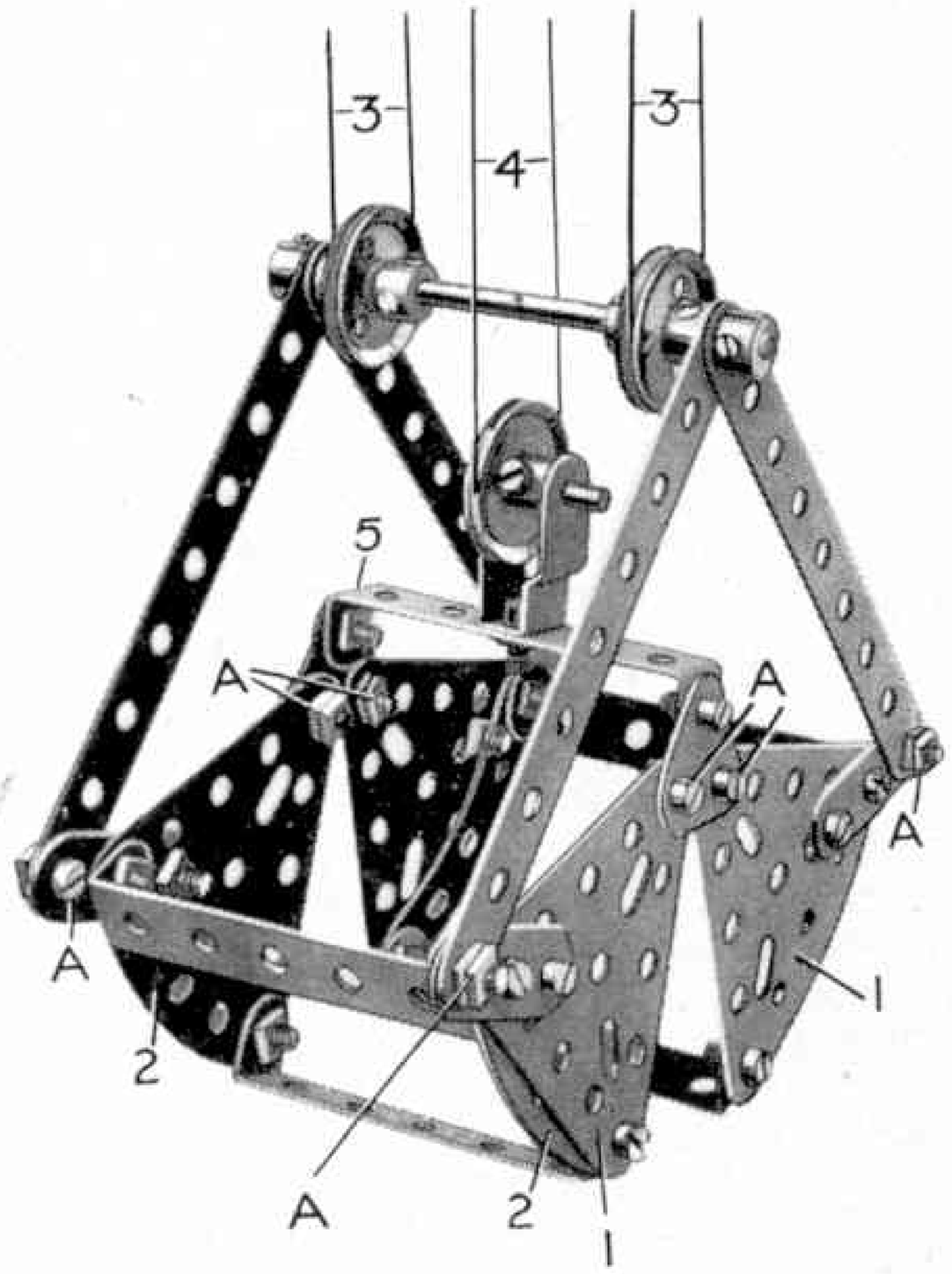


Fig. 1. A working grab that will be of interest to model crane builders.

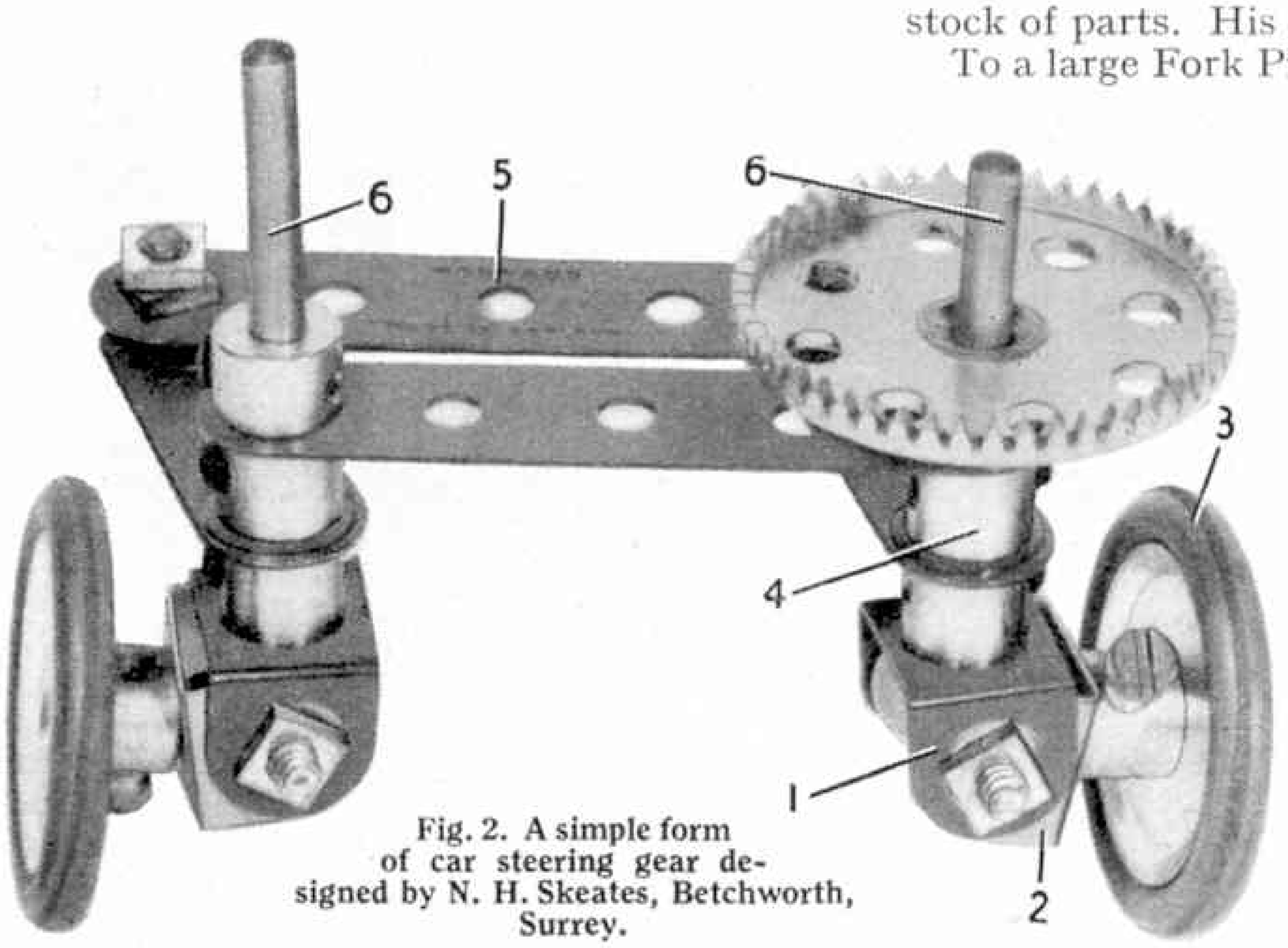


Fig. 2. A simple form of car steering gear designed by N. H. Skeates, Betchworth, Surrey.

bolts and lock-nuts. If the outer sides of the grab jaws are filled in with cardboard, the grab will pick up small loads of sand, marbles, etc.

Simple Steering Gear

Eleven-year-old N. H. Skeates, Betchworth, Surrey, asks me to include in these pages details of a simple form of steering gear he has designed, as he thinks it may be a help, and be of interest to, other young model-builders who do not possess a large stock of parts. His idea is shown in Fig. 2. To a large Fork Piece 1 a Double Bracket 2 is bolted at a slight angle to give the effect of camber to the road wheel 3, which is fixed on a $\frac{3}{8}$" Bolt passed through the Double Bracket. This construction is the same for both road wheels. The Fork Pieces are fixed on the ends of short Rods 6, one of which carries a Contrate Wheel that can be meshed with a Pinion on the steering column.

The track rod assembly is made by slipping a Washer over a $\frac{3}{8}$" Bolt which is then passed through the slotted hole of a Crank 4 and fitted with a nut that is tightened securely. The shank of the Bolt is then passed through an end hole of a $2\frac{1}{2}$" Strip 5 that forms the track rod, and is fitted with lock-nuts. This process is repeated for the other wheel.

This is an easy, yet effective method of steering, which does not entail any complicated construction features, thereby enabling inexperienced model-builders to make use of it.

Big Prizes for Small Models

LAST month we announced details of the Simplicity Model-Building Competition and as this is open for entries until August 31, we are repeating the main details so that any readers who did not see the previous issue will have a chance to prepare, and send in, entries.

In the "Simplicity" Contest we are offering Cash Prizes for miniature Meccano models of any kind constructed realistically with the minimum number of parts. It is not necessary for a model actually to work. A realistic appearance is all that is required. It is possible to make hundreds of really "life-like" models using no more than a dozen or so Meccano parts, and the prizes will be awarded to those who succeed in producing the most realistic and original models. The Competition is open to every owner of Meccano, and it is only necessary to send a photograph or a good sketch of any model you wish to submit. Entries should be addressed: "Simplicity Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13".

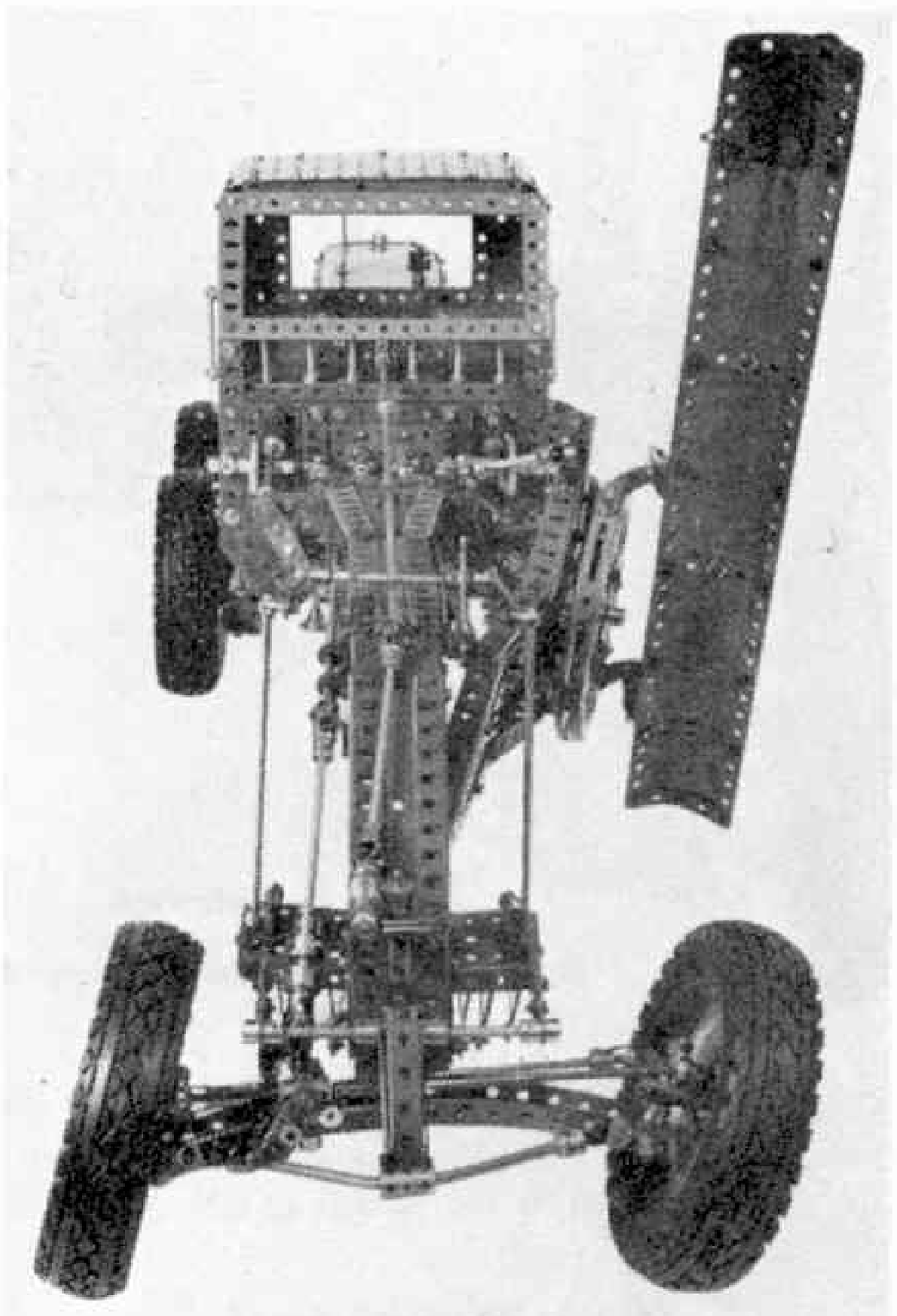
All entries will be grouped into one section, but the age of the competitor will be taken into consideration in assessing the merits of his work.

Your photographs or drawings, if unsuccessful, will be returned to you provided that a stamped addressed envelope of the necessary size is enclosed. It should be noted, however, that photographs of prize-winning models become the property of Meccano Ltd.

The prizes will be as follows: First, Cheque for £5 0s. 0d.; Second, Cheque for £3 0s. 0d.; Third, Cheque for £1 10s. 0d. There will be also ten prizes each of 15s., and ten prizes each of 7s. 6d.

Don't forget: the closing date is August 31.

Apprentice's Fine Meccano Model Motor Grader



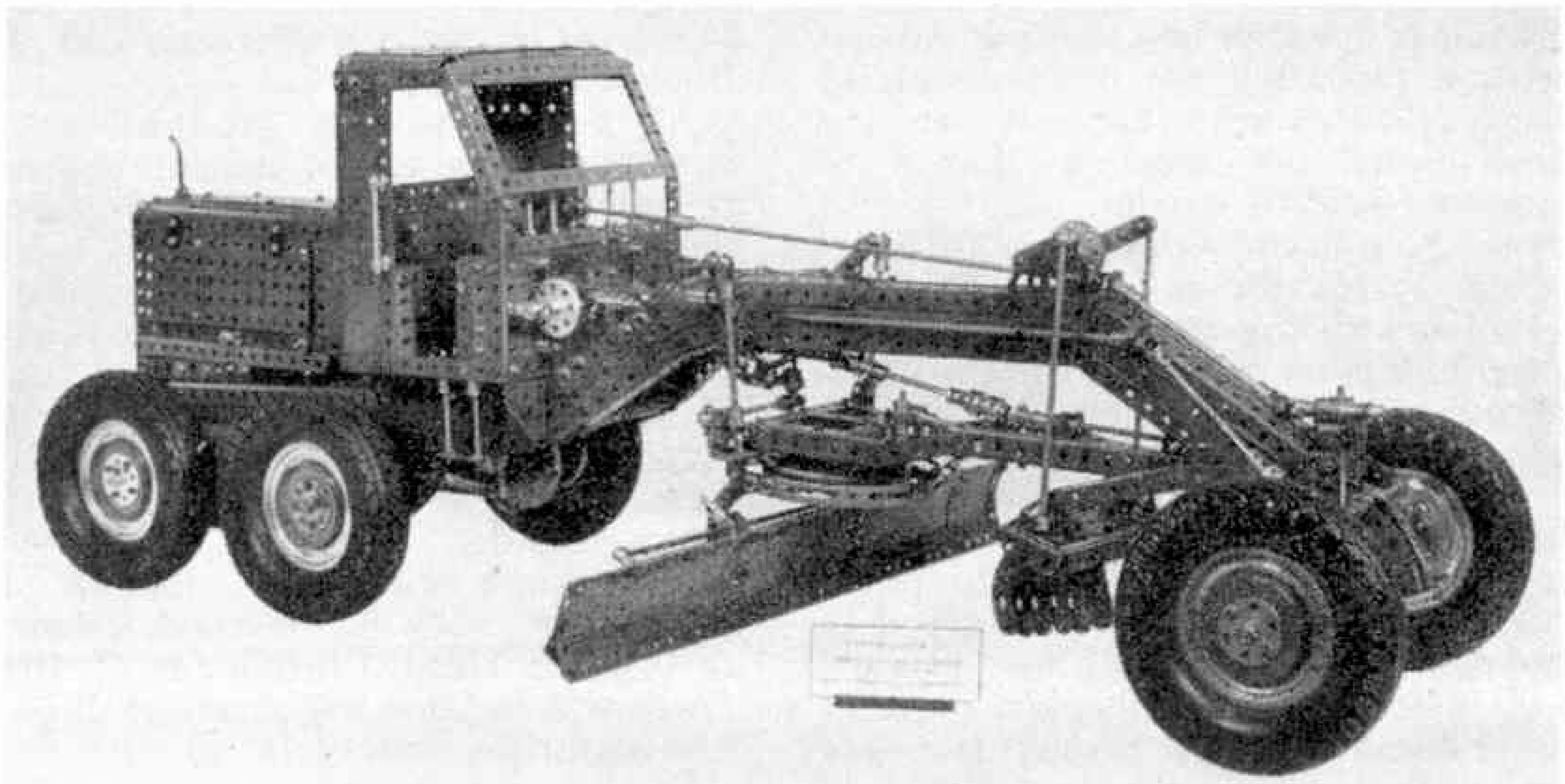
This view of Mr. A. Wenbourne's fine Meccano model of the Blaw Knox "Super 12" Motor Grader shows the blade in the extreme bank cutting position, and the front wheels leaned to counteract side draft experienced in heavy grading operations.

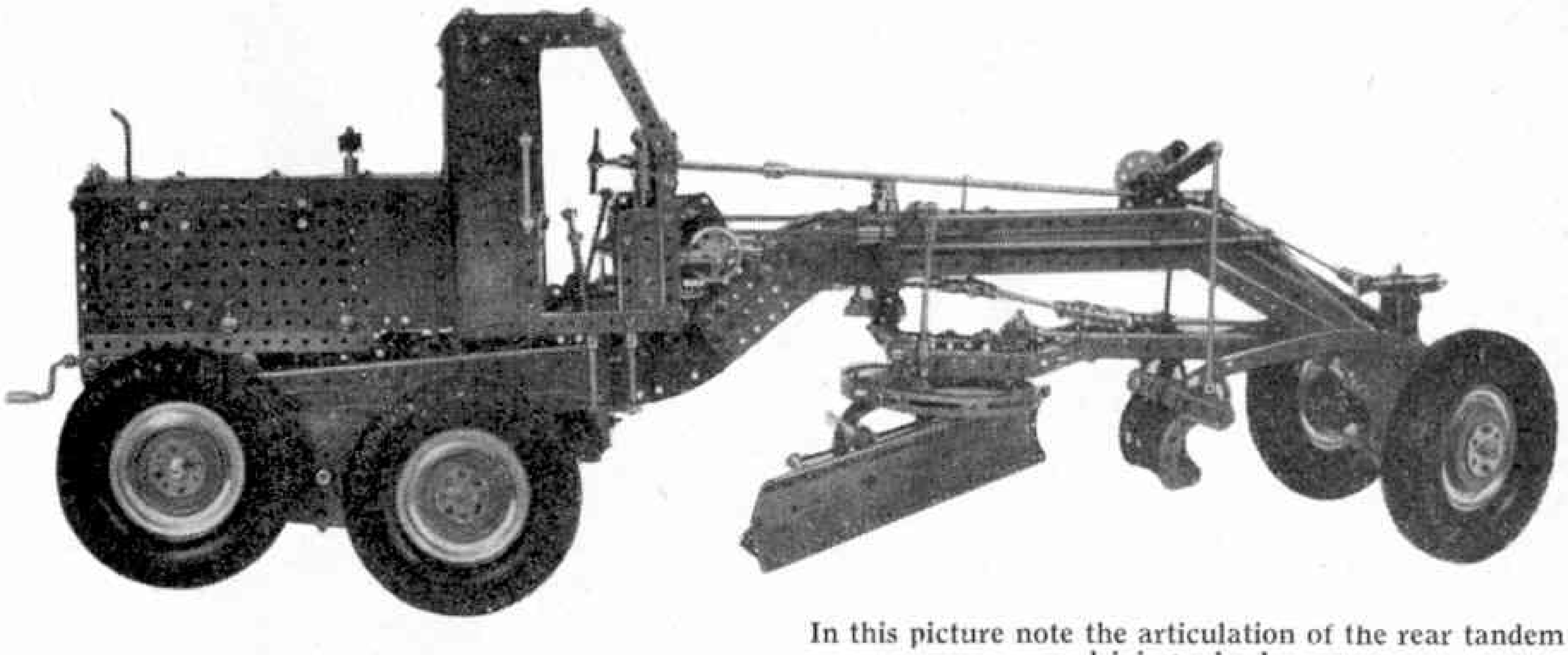
ONE of the most attractive, complete and finely-proportioned models that has come to our notice in recent years is a highly-detailed version of the well-known Blaw Knox "Super 12" Motor Grader. It was built by Mr. Alan Wenbourne, Rochester, Kent, and is shown in the illustrations to this article. Mr. Wenbourne, who recently completed his apprenticeship at the Rochester Works of Blaw Knox Ltd., began to build the model early in 1958. He is an expert Meccano constructor, as this splendid model testifies, and he has been interested in the hobby since he was eight.

Before describing the main features of this attractive model, we think that readers will be interested in the following details of the actual Blaw Knox "Super 12".

Although called the "Super 12" Motor Grader, road grading is only one of the many functions of this machine. By adjusting the grading blade it is possible to change from repairing and making roads, where the blade is underneath the Grader, to bank cutting and shoulder trimming, for which purposes it is adjusted at the required angle at the side of the machine. The adjustment of the blade for these various operations can be carried out by the operator in a few seconds, without

General view of the model, which is 3 ft. 3 in. long.





In this picture note the articulation of the rear tandem driving wheels.

moving from his cab. It is simply a matter of manipulating mechanical power controls placed within easy reach.

The Grader can also be fitted with a Scarifier, a kind of multi-toothed rake, which is used for ripping up worn road surfaces. The Scarifier is extremely robust, and its huge steel teeth, or tines as they are called, are made from tough manganese steel and are readily replaceable.

It is quite a sight to see the "Super 12" in action breaking up a hard well-worn macadam road with its eleven steel tines, ripping into the surface to a depth of over 1 foot.

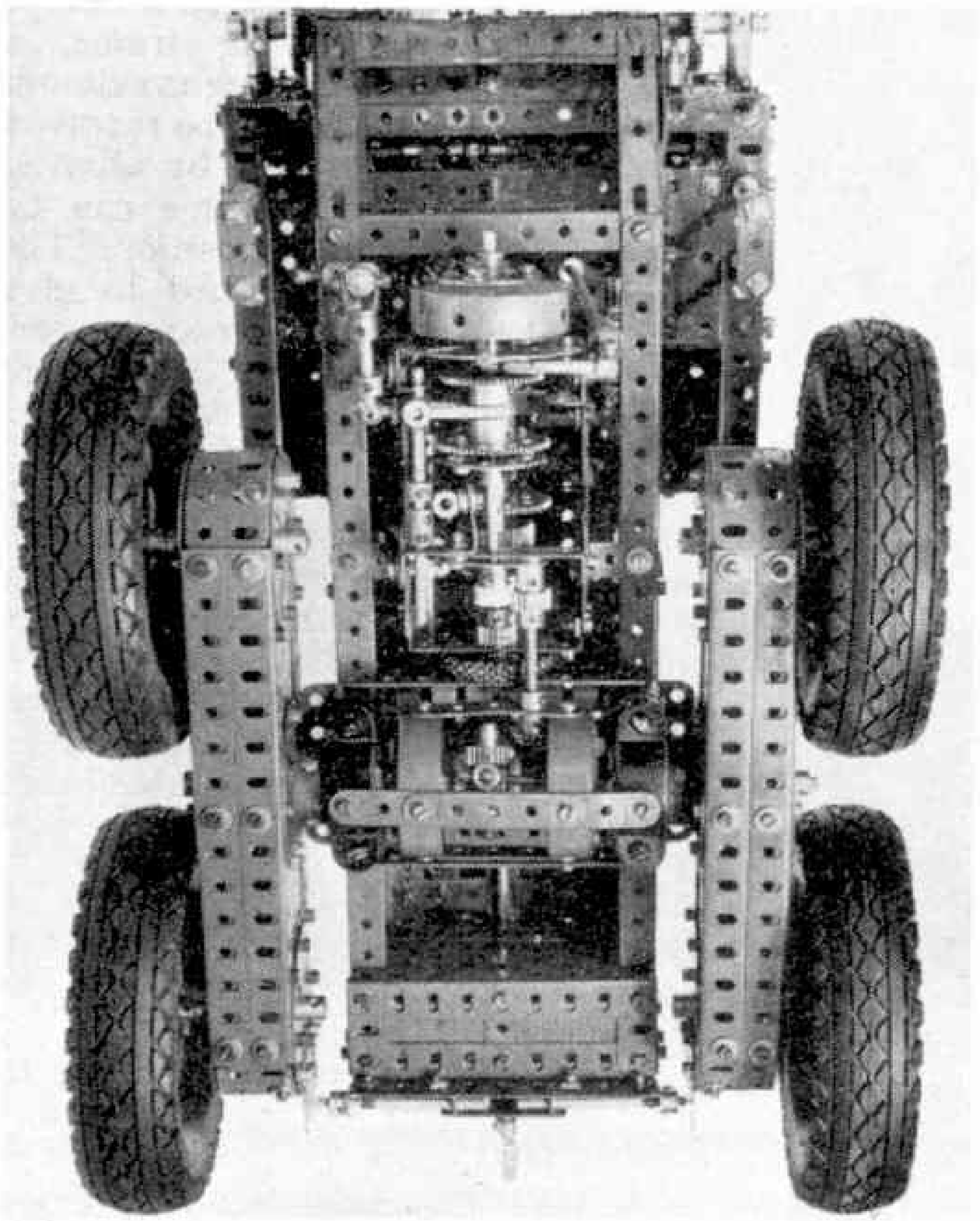
The Grader can also be fitted with a snow plough. When equipped in this way it is capable of clearing a 9 foot wide lane in one pass through the heaviest falls.

In fact, it is almost impossible to list all the functions for which a Blaw Knox "Super 12" is adaptable, and the power to carry out these different tasks is derived from a Leyland 6-cylinder diesel engine that develops 118 h.p. at 1,650 r.p.m. It drives through a gear-box giving six forward speeds ranging from 2·31 m.p.h. to 19·70 m.p.h., and two reverse speeds of 3·08 m.p.h. and 4·90 m.p.h.

Among other features of the "Super 12" are four-wheel tandem drive and leaning front wheels to counteract side draft and ensure a straight course.

In building his Meccano model of this Grader, Mr. Wenbourne has tried to reproduce the mechanical features of his prototype as accurately and completely as possible, and his effort, combined with a high degree of skill in the use of Meccano parts, has resulted in the really splendid workmanship seen in the illustrations.

The model is powered by a Meccano E20R Electric Motor, which transmits through 90 : 1 reduction gearing, to a heavy duty friction-type clutch operated by a foot pedal in the cab. Power is then transmitted to a six forward speed and two reverse speed gear-box, which incorporates an

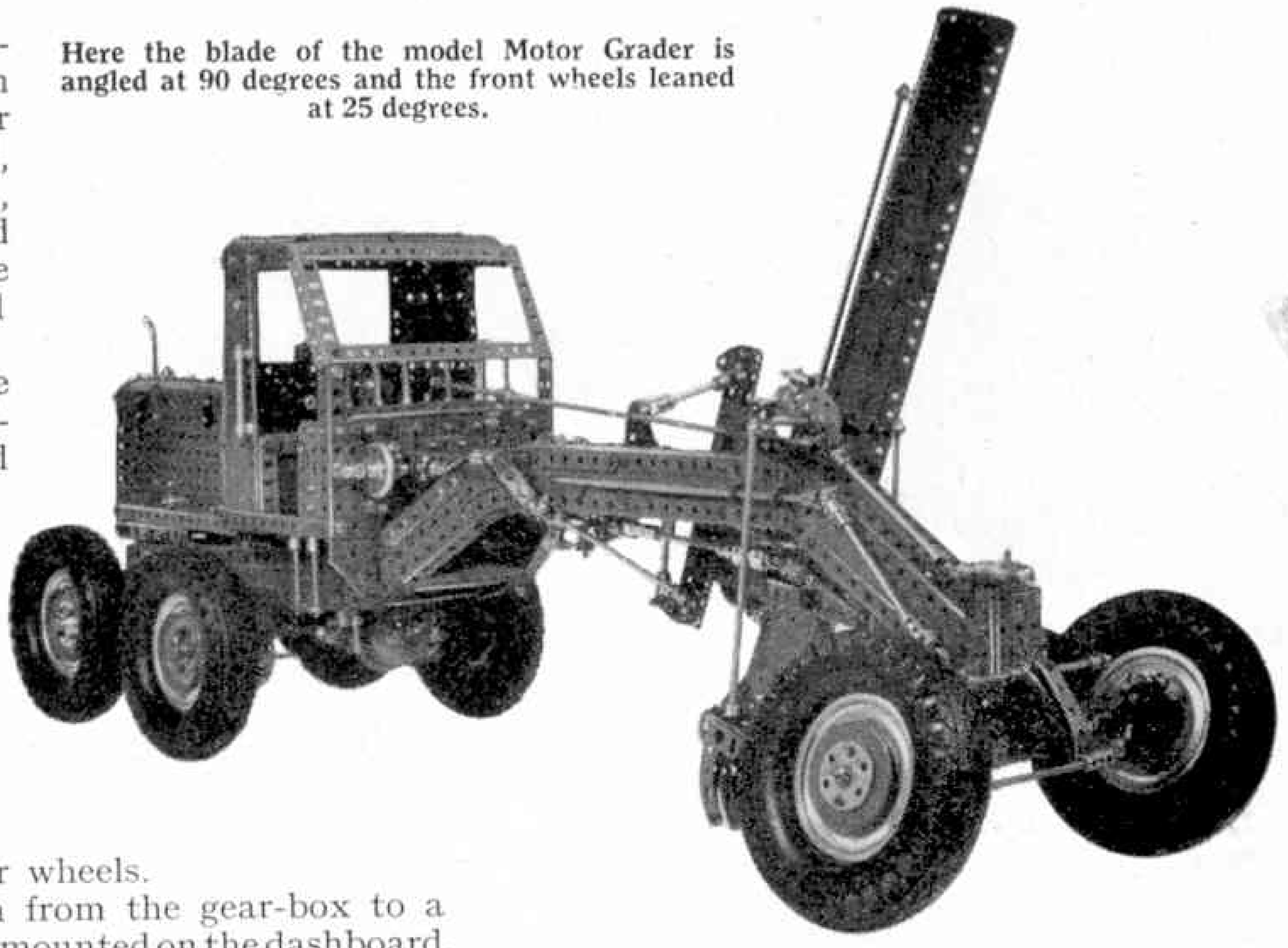


Underneath view, showing main gear-box and transmission to the four-wheel tandem drive.

internal expanding transmission brake. The gear ratios are forward, 1 : 1, 2 : 1, 3 : 1, 4 : 1, 6 : 1 and 9 : 1. The reverse ratios are 6 : 1 and 9 : 1.

The final drive consists of a differential situated in the semi-floating rear axle, half shafts of which are connected to tandem drive boxes on each side. These house chain drives to the rear wheels.

Here the blade of the model Motor Grader is angled at 90 degrees and the front wheels leaned at 25 degrees.



Power is taken from the gear-box to a power control box mounted on the dashboard.

This gear-box consists of six reversing mechanisms, each with a neutral position, which are engaged or disengaged independently by six levers situated three each side of the steering wheel. These six drives control: blade lift, left and right hand, side shift, circle, scarifier and wheel leaning. The blade is supported on a tilting frame, which is universally jointed at its front end.

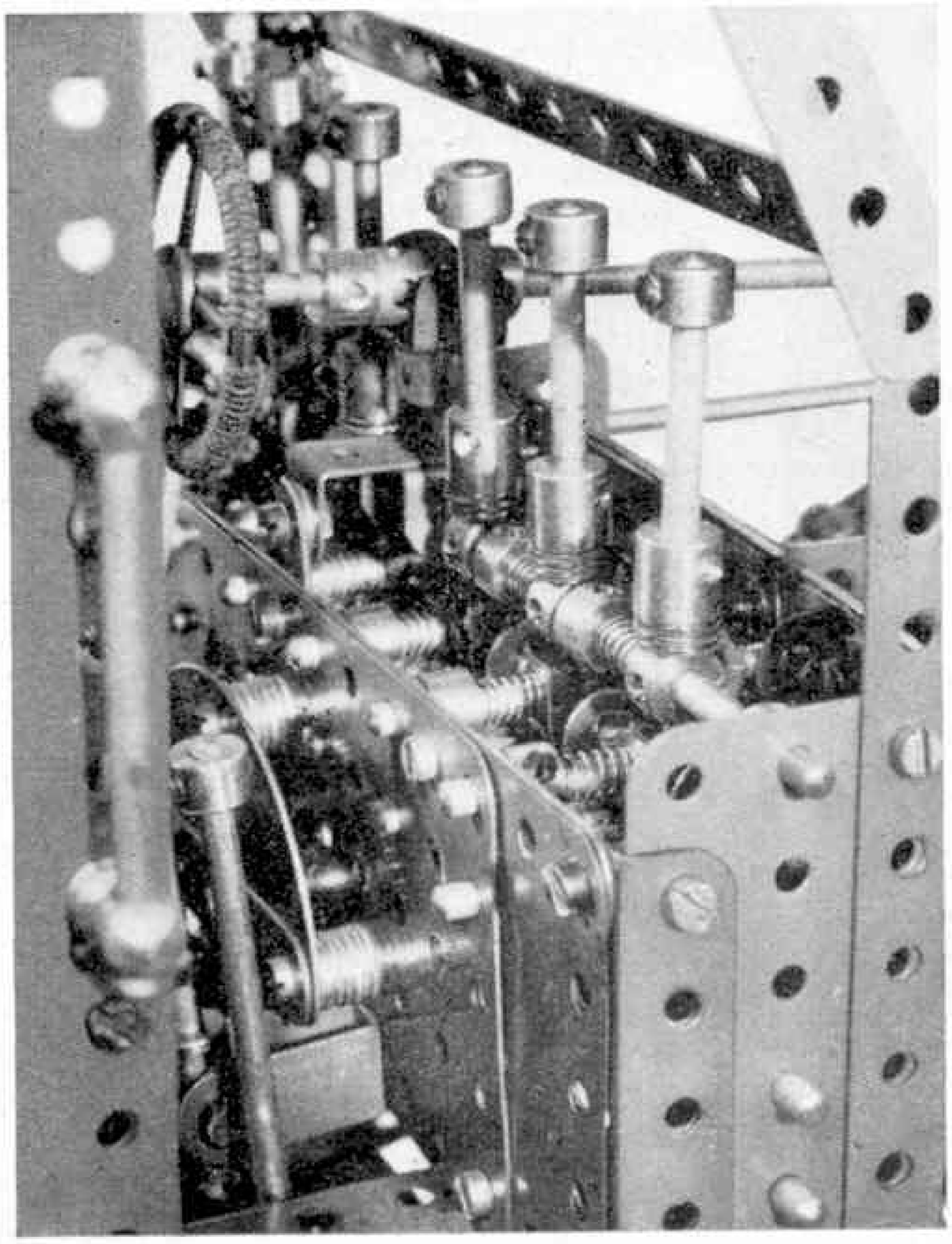
As well as being capable of mechanical side-shift, the blade can be moved sideways manually in the tilting frame, a combination of both giving maximum side reach. The blade can be revolved through 360 degrees and by altering the length of the lift arms can be driven into the vertical position. The front wheels can be leaned to give additional steering lock, or to counteract side-thrust when grading, just as in the real machine.

Provision is made for four-wheel operation by a locking device which acts on the tandem drive boxes, and enables either the forward or aft pair of rear wheels to be held clear of the ground.

Other features of this very fine model are a pivoting front axle, Ackermann steering, adjustable blade pitch angle and a toolbox at the rear of the frame.

The model is built to a scale of 1½ in. to 1 ft. and has an overall length of 3 ft. 3 in., with a total weight of 30 pounds.

We extend our congratulations to Mr. Wenbourne on his very fine achievement.



Close-up view, looking into the power control gear-box.

WITH THE SECRETARY

Club and Branch News

NEWS FROM AFAR

One of my most pleasant tasks as Guild Secretary is that of reading the letters and reports that reach Headquarters from Meccano Clubs in distant parts of the Commonwealth. In general, I hear from these Clubs regularly, and one of the most consistent in this respect is the fairly young, but very flourishing, Club at the Gindiri Secondary School of the Sudan United Mission, in northern Nigeria. This distant outpost of the Meccano Guild is indeed "in the heart of the country", as it is thirty miles from the nearest railway! But this remoteness from railway and other engineering activity in no way diminishes the enthusiasm of the members, and with the aid of Manuals, Instruction leaflets, and the very willing help of the seniors the younger members will "have a go" at *any* model, with immense enjoyment. In spite of limited funds, the Club has already amassed enough Meccano equipment to be able to tackle No. 10 Outfit models. Congratulations, Gindiri M.C.!

CLUB NOTES

ASHTEAD FREE CHURCH M.C.—A recent very successful Exhibition included an excellent display of Meccano models built by the members. A visit to Epsom Head Post Office enabled the party to see at first hand sorting and cancelling of mail in quantity, and was much enjoyed. At one meeting a quiz game was held, in which the great variety of questions proved most entertaining. *Secretary:* Douglas J. Davey, 39 Newton Wood Road, Ashtead, Surrey.

AUSTRALIA

MAYLANDS M.C.—Members have been very busy building large working Meccano models for the Club's display at the Perth Homes and Industries Exhibition. Models completed or under construction for this important event include two original Meccanographs, Meccano twin-engined Monoplane, Grandfather Clock, Bagatelle Table, Four-Speed and Reverse Motor Chassis, and an Automatic Ship Coaler.

In order to encourage a higher standard of model-building in the Club, "Model of the Month" and "Idea of the Month" schemes have been introduced. The first awards went to Lynsey Carter for his splendid model of the 1A Motor Chassis (Model of the Month), and the very effective clutch mechanism (Idea of the Month) he designed for it. *Secretary:* Warren Bransby, 90 Crawford Road, Maylands.

NIGERIA

GINDIRI BOYS' SECONDARY SCHOOL M.C.—Additional Meccano has been purchased. The three teams into which the members are grouped are making excellent progress. On the model-building side, one group is building the No. 10 Outfit Schools class locomotive, and another group is at work on a model of the Sydney harbour bridge. *Secretary:* Mtaku G. Mshelia, Gindiri Boys' Secondary School, P.O. Barakin Ladi, Via Jos, N. Nigeria.

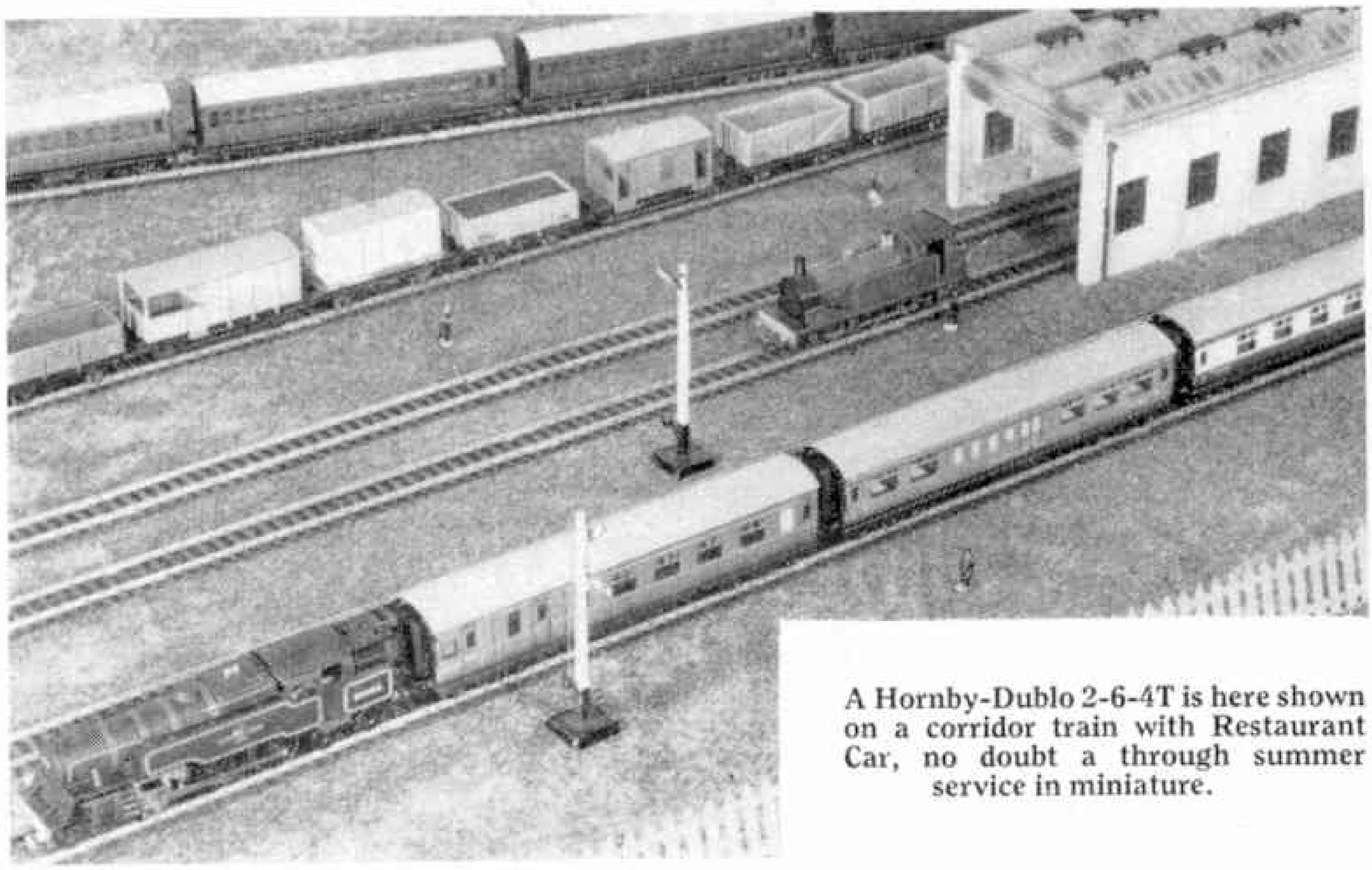
SOUTH AFRICA

CAPE PENINSULA M.C.—Members have been busy both at the Club room and at home building models for the Club's winter competitions. At one meeting T. Venn, ex-Secretary, gave a very interesting lecture on British Railways, covering the history of the four big companies up to nationalisation and of British Railways since. *Leader:* Mr. Z. A. de Beer, "Royston" No. 3 Stanford Road, Rondesbosch, Cape Town, South Africa.

NORTH END (PORTSMOUTH) M.C.—Members have already started serious preparation for the big Exhibition to be held next August, and many of the model items are already nearing completion. The 6 ft. long model warship, with automatic gun turrets, is almost finished, and the model aircraft display is well advanced. The associated H.R.C. Branch is re-constructing its layout. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

BRANCH NEWS

LUTON COUNTY SECONDARY TECHNICAL SCHOOL—A start has been made on the construction of scenery for the Branch layout. With the completion of the second circuit of track it has been found necessary to make a junction box. This consists of two 2-way switches, so wired that current can be supplied independently or to both tracks. *Secretary:* R. J. A. Scott, 7 Victoria Road, Hitchin, Herts.



A Hornby-Dublo 2-6-4T is here shown on a corridor train with Restaurant Car, no doubt a through summer service in miniature.

Where Summer Means Increased Traffic

HORNBY RAILWAY COMPANY

By the Secretary

ALTHOUGH on some Hornby-Dublo railways activities ease off during the summer months, on many layouts the summer season actually sees an increase in the number of trains operated. Owners of such lines are clearly endeavouring to follow B.R. practice in providing increased services in summer in view of the holiday traffic that is inevitable at this time of the year.

In miniature, as in real, practice duplication of services may become the rule, particularly if we base our operations on those of a busy Saturday. Similarly, where one train serving various destinations is normally sufficient, traffic may require the provision of a separate complete train for each main point served.

All this sort of thing adds up to a considerable amount of activity in the provision of locomotives and rolling stock for the services required by the summer timetables. Here the owner of a good selection of passenger stock may be reasonably well equipped to make up the different trains his traffic arrangements call for. On the other hand, the owner of a smaller selection may well be able to produce satisfactory results by careful re-arrangement of his train formations and working. Even so, it is not a bad thing to have one or two spare vehicles available in the sidings for busy times.

May have Busy Time

Of course there are sure to be plenty of demands for restaurant facilities, in which case the Hornby-Dublo Restaurant Car is likely to have a busy time on many layouts. Some of your trains that do not normally include a Restaurant Car may now require this addition. So, perhaps, you may have to get another of these vehicles or revise your workings in order to obtain the greatest possible use from the car or cars that you already have. This kind of thing may well lead to some variety in colours in train make-up, but this will be quite in keeping with what is found in real life. Real stock in standard maroon, or red and cream, or other liveries may well appear in the same train and this sort of thing usually appeals strongly to the enthusiast.

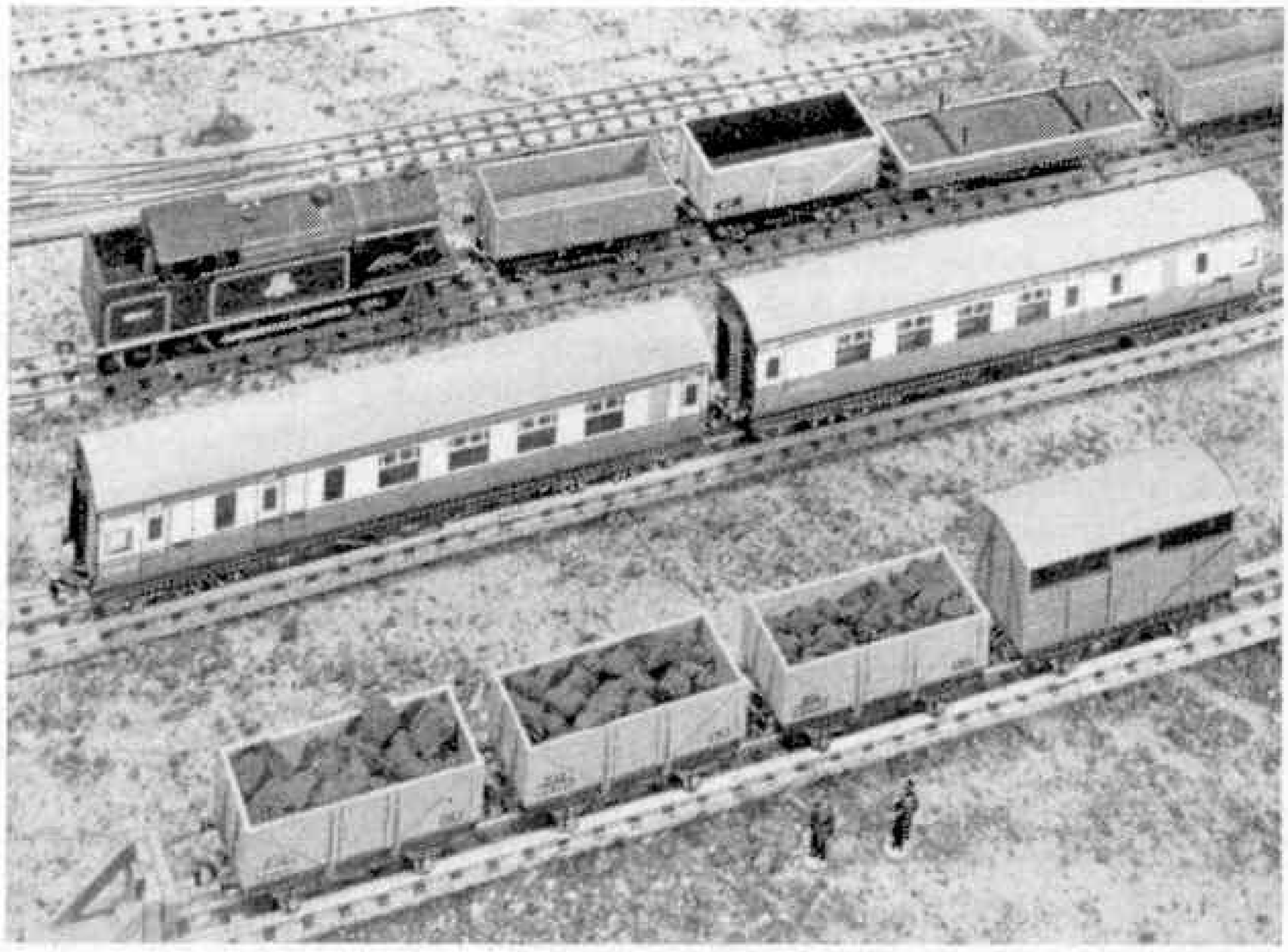
Certain cross-country and similar services

Hornby-Dublo "City of London" is being made ready for a long run, perhaps on "The Caledonian" or "The Royal Scot", on this Two-Rail layout.

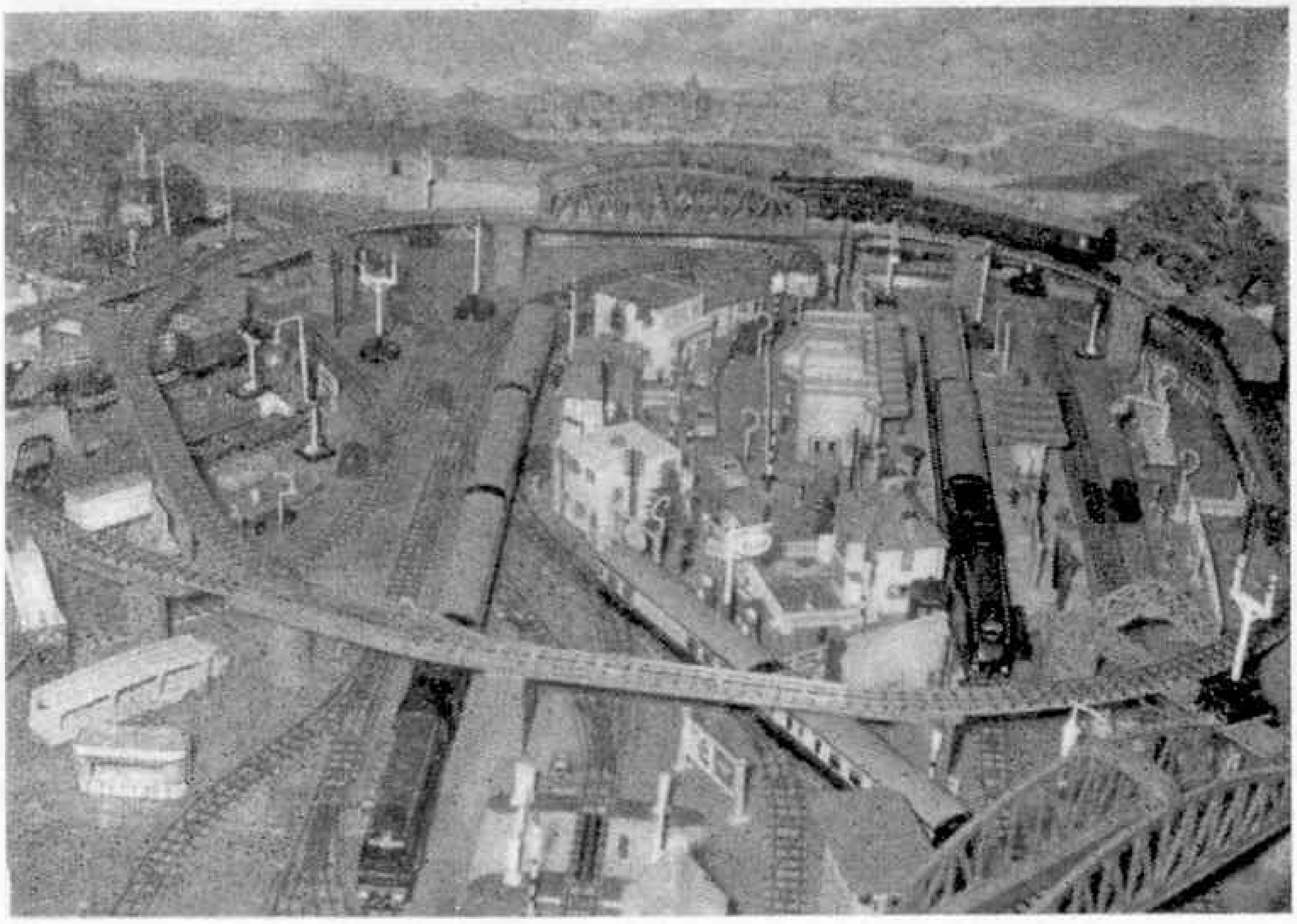
between different Regions may operate only during the summer season, so here is a chance for the Hornby-Dublo owner to introduce one or two novel workings. Take, for instance, the train shown in the picture at the head of our talk. Here we have a train of corridor stock, complete with Restaurant Car, hauled by a Hornby-Dublo 2–6–4 Tank locomotive. It is not the type of engine we normally associate with long-distance through trains, but it is possible for some real W.R.–S.R. through trains to be handled in this manner. You will see that coaches in different liveries are included in the train. The brown and cream W.R. stock normally reserved for the named trains can sometimes wander into other services. So the inclusion of the third vehicle, which is a brown and cream one, with others in different colours in the Hornby-Dublo train is quite justified.

It is also important that your trains should be readily identified, so you will be able to make considerable use of the Hornby-Dublo Locomotive Headboards and the self-adhesive Train Name and Destination Labels, with which I think you are all familiar.

A rather different type of train seen from time to time, normally during the spring and early summer, usually consists of a varied collection of goods-type vehicles. This is the weed-killing train run over the tracks in order to spray weed-killing solution over the permanent way. Its make-up varies, but as a rule there is at least one tank wagon for carrying the weed-killing liquid and several vans, or perhaps an old coach, for materials and staff, with a goods brake van in the rear. There are several Tank Wagons in the Hornby-Dublo system and perhaps you have an old one that has become a little shabby with hard wear. You may feel that it could be painted over and pressed into service in your "weed-killing" train.



Spare Corridor Coaches are stored in the siding ready for any sudden demand because of additional summer traffic.



A fine aerial view of the Hornby-Dublo layout of C. H. Meyerhoff, referred to in this article.

Raised Railways

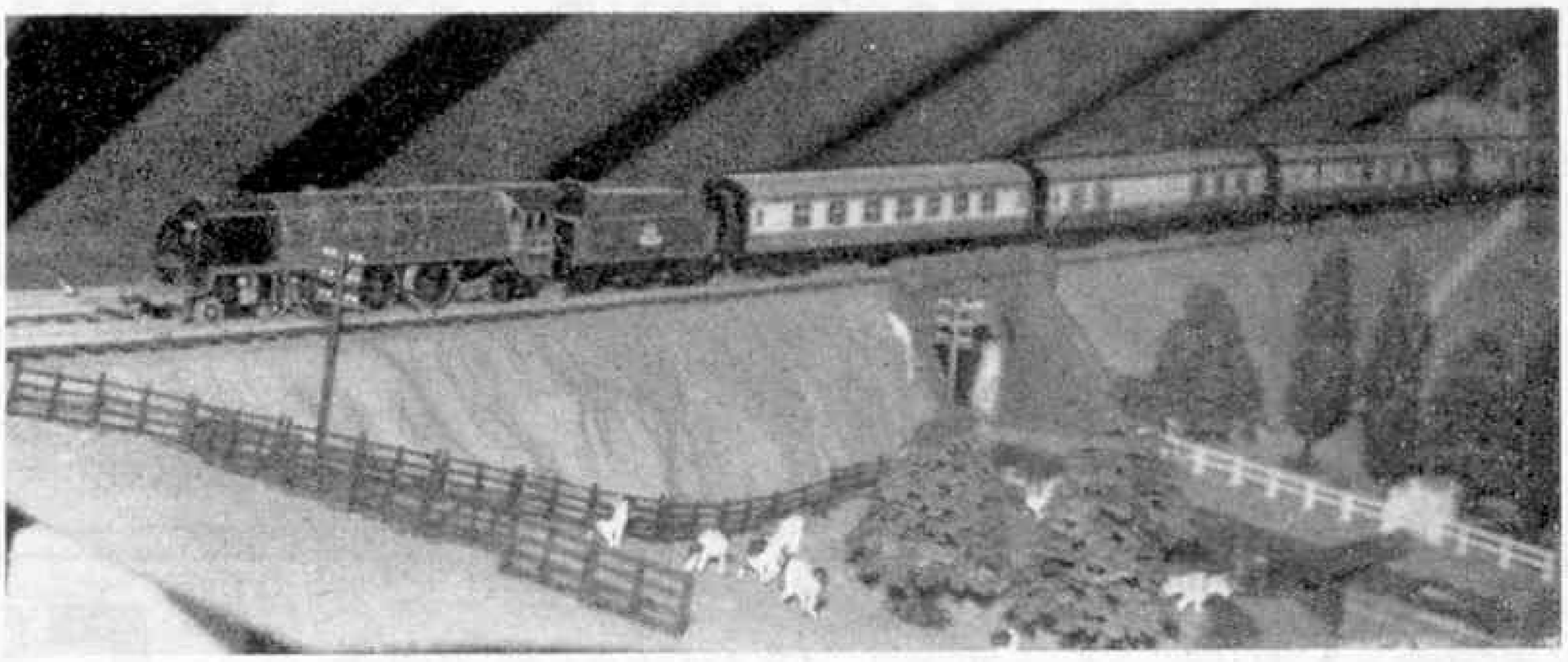
By "Layout Man"

WE have a good Hornby-Dublo railway to begin with this month in the system depicted above. This is the railway of C. H. Meyerhoff, of Buckie. Although this appears to be a somewhat complex affair, it is not so really and from the control point of view there are quite clear-cut divisions between the various main sections.

The layout is arranged on two levels, but let us deal with the lower or baseboard level first. The basic form of the system there may be described as being like the letter "L", although each stroke forming the "L" consists of a more or less oval track formation. The first and more important section, as it were the vertical stroke of the letter, consists of a double track main line with a reverse loop lying diagonally between opposite sides of the inner track. Various tracks that serve goods and passenger stations branch off on both sides of this diagonal line, which can be seen quite clearly in our picture. There are two coaches standing on it in the lower centre of the illustration and the station layout branching off from this diagonal track is shown to the right.

The oval forming the shorter stroke of the "L" is a single-track section connected to the outer main line already referred to in such a manner that a triangular junction is formed. This provides for plenty of variety in train running and it is, of course, most useful for turning locomotives or for turning complete trains by a succession of shunting movements. Within this secondary oval is another station layout, including a standard Hornby-Dublo Through Station and providing accommodation for goods traffic in addition. Diverging from one side of the triangular junction is a connection that leads to an engine shed. There is another locomotive shed and siding in one corner of the section of the layout board that accommodates the double track main line. This installation lies more or less in the space between the two main oval sections.

As happens sooner or later on most layouts, the limits of expansion at normal baseboard level have been reached, the presence of a miniature township, village and other lineside effects preventing any worthwhile development of the railway on the original baseboard. So a fairly recent event has been the building up of a raised section of layout that begins as a branch from the secondary oval track mentioned earlier. This incorporates the section of elevated track that you can see in the



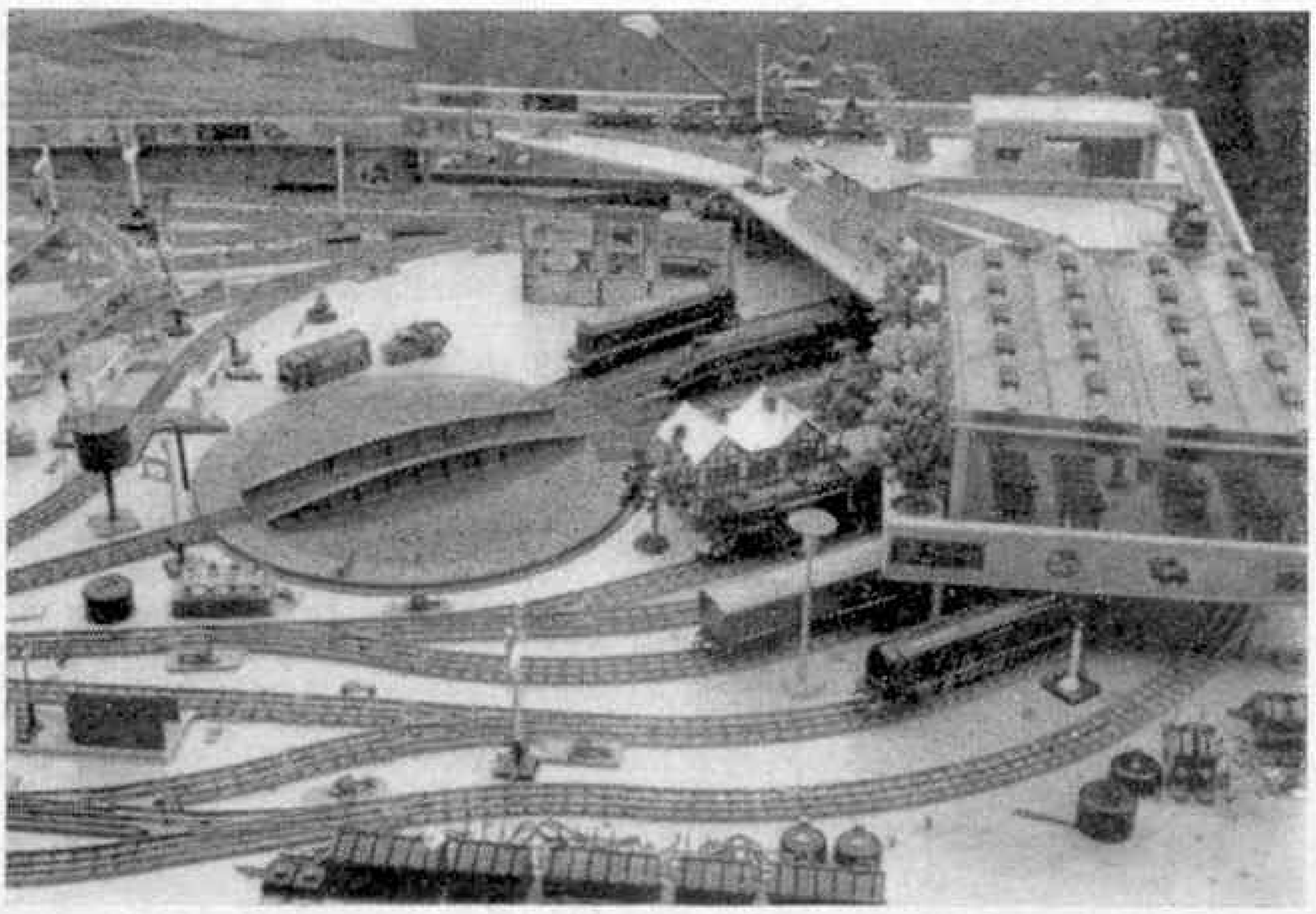
A realistic embankment section on the loft railway of D. J. Lees.

illustration and over this part continuous running if required is possible. There is a triangular junction arrangement, of which part can be seen on the left of the illustration. Of course this raised section is just the place for the inclusion of the two Hornby-Dublo Girder Bridges you can see. The one in the foreground carries a high-level branch across the diagonal siding tracks below.

Clearly, on a layout such as this operating possibilities are extremely varied and the fullest advantage is taken of the diversity of routes afforded on both high level and baseboard level sections. The layout is well provided with Hornby-Dublo Signals in order to deal with the various movements and both semaphore and Colour Light Signals are employed.

In the lower photograph here we return again to the layout of Vernon Jeffery, of Cuffley, H.R.C. No. 263513, part of which is shown in its latest form below. The space problem had become acute on the original baseboard and as it was desired to incorporate the buildings that can be erected by means of the Hornby-Dublo standard Kits it was decided to add a high-level section. As on the layout we have just been talking about, a track branches off at a convenient point from the original main line to lead up to the raised section. Actually this connection can be seen immediately to the left of the bank of Switches shown in the foreground. How well the high level has been arranged can be seen in this view. Wisely, no attempt has been made to "box in" the sections underneath this raised base. In fact, so far as the tracks radiating from the turntable are concerned, it would not have been practicable to do so. Thus a realistic "covered way" effect is obtained as trains make their way along the tracks underneath, and the open form of construction ensures that they can readily be got at in the event of a derailment, or other mishap.

A layout in an unusual location appears in the illustration at the head of this page. Advantage has been taken of the roof space and you can see some of the beams quite clearly above the train. The section of layout shown passes over the realistic embankment that spans a miniature valley. The landscape work apparent is very effective and I particularly like the manner in which the lineside fencing is allowed to weave about as it often does in real life.



The high-level section recently added to the layout of Vernon Jeffery, H.R.C. No. 263513, is clearly shown in this picture.

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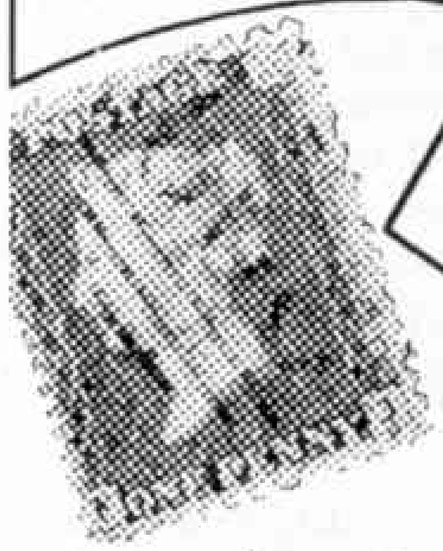

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Stamp Collectors' Corner

By F. E. Metcalfe

VARIETIES

I had intended to write just a paragraph on a phase of collecting which just now is engaging the attention of British collectors of our own Commonwealth stamps to a very great extent. But when I turned over the various points I would have to mention, I found there were too many to be dealt with in a few sentences, if they were to be referred to adequately and as their present importance merited, so here are some fuller notes which, I hope, will be of interest.

There are various kinds of varieties, as I have mentioned in the past, colour variations (shade as collectors call them), perforation differences, retouches, re-entries (I will refer to these further on), plate flaws, and all kinds of errors. In the past some varieties, such as shades, perforation variations and various errors, have been included in catalogues which are not framed on simplified lines, and thus these can be said to be well founded.

But latterly, for one reason or other, increased publicity has been given to what were, in all too many instances, tiny flaws which, if found on any stamps in one's collection (provided they are constant) are all right to keep. But as many of them are being offered at fancy prices a word of warning seems necessary. Let us, however, first consider what the varieties which stamp collectors are interested in really consist of.

First of all, we get perforation varieties. When a stamp first appears, its perforations are regarded as standard. It sometimes happens that perforations vary, but this is unusual. Then there are subsequent printings, and occasionally other perforation heads have been used and we get changed measurements. These are considered first-class varieties and are much sought after. Incidentally, when we say that a stamp is perforated, 14, we mean that there are fourteen holes in 2 cms. If you get a perforation gauge, which any dealer will provide for about ninepence, you will find, at one end—as a rule—a black oblong exactly 2 cms. in length. Put your stamp (not forgetting to measure the top as well as the sides, for they may differ, and often do) alongside, and count the holes. That will give you a rough measurement. Then place your stamp against the dots on the gauge which have the same number marked as the number you have counted. If they do not quite fit, try the fractions. With a bit of practice, you will become quite expert at this and will have learned to do an important stamp chore. But make certain that all (yes, *all*) the perforation holes fit exactly the dots on the gauge.*

The next class of variety, in popularity, are the shades. As I have said, these are colour variations, and they sometimes arise when new printings are made. Anyone who knows anything about matching inks will know how difficult it is to repeat the exact colour. even when the formula of the ink constituents used is known, and the wonder is not that there are any subsequent colour variations, but that there are so few, for generally new printings of stamps come out exactly as before. (*Continued on page 373*)

**There are, of course, various types of perforation gauges of which this is only one.*

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For other Stamp Advertisements see also pages 368 and 372

Stamp Gossip

STAMPS ON STAMPS

As we all know, Britain was the first country to issue postage stamps, and while from time to time attempts have been made to try to deprive her of that honour by the production of one kind of label or another, along with a claim that here was a stamp which appeared before the "Penny Black", none have been accepted. Britain still retains the credit. Well, other countries followed the lead, and the next step was the "Centenaries", when one country after another issued a set of stamps to commemorate their stamp centennial.

After that (for some postal administrations are always on the look-out for something that will tempt collectors) we got the yearly issues to commemorate "The day of the Stamps" and as these often show a stamp on a stamp, they fell right into popularity. Each one that appears is snapped up by collectors (and not just juniors) and it must be admitted that they make an exceedingly interesting collection. I suppose in time a catalogue will be published which will make their collection easy. As it is, Gibbons "Simplified" Catalogue is the one you need to get details of all the "Stamps on Stamps" which have been issued. An up-to-date edition—one for last year costs about half—costs 22s. 6d. That may seem a lot of money, but it is really a bargain. In its field there is no other catalogue to touch it.

PROVINCIAL COSTUMES

I suppose that, in time, the beautiful provincial costumes still used in countries like Hungary, Poland, etc., will be replaced by the not so beautiful costumes favoured in other parts of the world. It will be a sad day when that comes about. In the meanwhile, some of the countries where such dresses are still worn have issued stamps depicting the variousstyles. Poland, for instance, has just issued such a set and it does the object credit, as the illustration shows. Pity the colours of this stamp could not be shown.

Mind you, these dresses are actually worn and are not just museum pieces. I remember once in the Budapest Opera; a whole row of stalls remained vacant until it was almost time for the opera to begin, then there was quite a movement down the aisle, and in walked about twenty young women, all dressed in provincial costumes with wide, flowing skirts, held out, no doubt, by a number of starched petticoats. The leader came to the row of stalls obviously reserved for herself and her companions, but when she tried to push through to take her seat, she simply could not do it, for the skirt was far too wide. It had to be a case of right about turn, and out. Apparently these beautifully-dressed girls were from the various regions of Hungary on a free holiday in the capital which was their reward for having been work leaders in their respective regions. On Sunday trips into the country I often saw similar costumes being worn by village maidens.

THAT CHILEAN PLANE

Some readers will remember that in the March Magazine "Gossip" I referred to a Chilean stamp which depicted a plane, and I queried its type. Now there can be very few publications in the world with an average run of readers who have sharper eyes than those who subscribe to the *Meccano Magazine*, and I

(*Continued on next page*)

STAMP ADVERTISEMENTS

(see also pages 368 and 370)

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Stamp Gossip—*(Continued from previous page)*

thought it would not be long before the identity of the machine in question was established. I wasn't wrong, for early in March Mr. Peter Short, of South Shields, wrote as follows: "From the various photographs of the actual 'plane, it is certain that it is a Morane-Saulnier M.S.760 Paris. This has two 880-lb. thrust Marbore II turbojets, which give it a cruising speed of 335 m.p.h. It carries a maximum of four people (including the pilot) in the cockpit".

I am sure that many thematic collectors who, like myself, know more about stamps than 'planes, will be very grateful to my correspondent for his information, for now they can write in the details of an interesting stamp.

SAYING IT WITH STAMPS

The problem between India and Pakistan regarding the ownership of certain territories is well-known, and now the latter country has given more publicity to the question by the issue of four postage stamps, all of the same design. I think it was rather expected at the time of release that these might cause a bit of trouble. In fact, just before the stamps did appear, it was rumoured in Pakistan—if not in India—that correspondence bearing these stamps would be rejected by the latter. The states, or districts, in dispute are Jammu and Kashmir, and these are depicted on the stamps, with the comment "Final status not yet determined". Whatever our views on the subject may be we will all find the stamps of interest. Fortunately, used copies are coming over well on correspondence, and while the bottom value (6p) only costs a copper, if we wait a little while we should be able to obtain a complete set of four used for about two shillings, or even less. But if you do want a set, do not wait too long. At the beginning of next year Pakistan's currency will be changed, and naturally all existing stamps of that republic will be replaced by others, in line with the change in question.

THE "QE" CATALOGUE

An appreciable percentage of *M.M.* readers who collect stamps (and many do) are particularly interested in those issued by the various countries in the British Commonwealth during the present reign, and more and more are taking up this group of stamps; I have evidence of this from letters I receive. But there is only one catalogue devoted exclusively to "QE" stamps, and at the moment it is out of print, although there may be some shops which have an odd copy left. In fact, I recently saw one in a stamp dealer's window in London. There are other catalogues which list "QE" stamps, but as other stamps are included they cost more than the Commonwealth "QE" catalogue, and do not contain as many varieties. Anyhow, we are now at the period when we are able to get out into the open, and are perhaps not paying quite as much attention to our stamp collection as we shall be doing at the end of the summer. By then, the 1961 edition of this "QE" catalogue will be ready for publication, with all kinds of new data.

FESTIVAL HALL

Not long after these lines appear in print, lucky collectors in their thousands will be visiting the great international stamp exhibition which is being held in the Festival Hall, London, early in July. I suppose most of us will attend and thoroughly enjoy ourselves, not only viewing the fabulous stamps laid out for our delectation, but all the stamps, etc., which the dealers will have on display. But how many of us will spare a thought for those who, for more than two years, have been giving their services free to make this show possible? Yes, enjoy the show. It won't be hard to do that, but just spare a thought for those who made your enjoyment possible.

THE TIP OF THE MONTH

I saw a very nice little collection the other week, formed by a young collector at very little cost. It consisted of the special issues only which had been released during the present reign by the Canadian Post Office. Both mint and used stamps were included, and by careful arranging in a loose-leaf album, with details (obtainable from the catalogue) neatly written in, a really nice little philatelic show had been evolved. Such a collection will never be worth a fortune (for, unfortunately, there wasn't a copy of that "Seaway" stamp with the inverted centre), but it will always be worth showing to even non-collecting friends, without boring them. This is something which cannot always be claimed for some collections which are worth as many pounds as the collection I am referring to is worth pence. What about a similar sideline collection?

Stamp Collector's Corner—(*Continued from page 369*)

Yet, we do get shade varieties sometimes and these, like the different perforations, are prized by collectors and not just by specialists. But a word of warning here. A worthwhile shade is one where the colour of the ink really differs, and not just when the stamp is a bit deeper or lighter in colour, for you can get that in a single printing run, due to the ink varying slightly in consistency.

The next class are, shall we say, the re-entries. These are rather specialist items, yet all collectors who understand what they are and how to look for them, find them of great interest. Often they are quite valuable. Nowadays all but the most exacting specialists classify all re-entries together, yet there are two kinds. The first, which is really a fresh entry, occurs as the plate is being made, when there is a necessary correction; the second is when a damaged plate is being repaired, but in both cases traces of the original impression on the plate remain. Then when the stamps are printed, there is a duplication of part of the design. Just examine a stamp carefully under a magnifying glass, and if you can see any double lines, maybe you have found a re-entry. If you have a copy of either a KGVI or QEII Commonwealth Catalogue you can see certain re-entries illustrated, and these will clarify the point I seek to make.

Now we come to retouches, also very popular, and these varieties arise where the printers have been erasing, as it were, flaws on a plate, or where they have been strengthening the design where it has become worn. The illustration on page 369 of part of a Falkland Is. Dep. stamp shows what I mean. This has been fixed up as an example, and shows two retouches which look like clouds, similar to those which actually exist on other stamps. A number of good retouches are to be found on "QE" stamps, and the most outstanding of these also appear in the Commonwealth Catalogue.

Then there are the errors, such as imperforate specimens, double surcharges, etc., which I have no room to go into here, for I am anxious to deal with flaws as it is in this class of variety where, although there is a lot of fun to be had, there is also plenty of danger. The danger lies in the fact that a lot of trivial dots and dashes exist, especially among our current British photogravure stamps, which are being exploited at, in some cases, quite absurd prices. Flaws, of course—that is, imperfections of printing plates—exist with line-engraved as well as photogravure stamps, but it is in the latter that you find the most. It would be difficult to examine a sheet of our current stamps carefully without coming across slight flaws which are mostly of no significance whatever. A small minority are quite nice, particularly when thay have been sufficiently obvious for the printers to have noticed them, and when the latter have retouched the damaged part of the design in an endeavour to correct it.

For instance, one of the 1d. "Graphite" coils—those stamps with the black lines on the back, which are an aid to facing up for sorting letters—has one of the stamps where the dot under the left "d", in the left bottom corner, is missing. Another 1d. stamp has two dots on the right side (these are constant varieties, that is to say that they are cylinder flaws, and are thus worth considering). Both these varieties exist on the stamps with the St. Edward's Crown watermark.

Now, the same stamps had been issued with the new Crown watermark, and what makes them interesting is that the printers have inserted a dot where formerly it was missing, and have also touched out the extra dot. Where the dot has been inserted, it is easy to detect, for it is smaller than normal, and quite round, whereas all the rest are oval. The touching out of the extra dot on the printing cylinder has been very well done, but it can be detected, and thus you get quite nice philatelic varieties in each case. Mind you, they are not rarities, and fancy prices should not be paid for them.

There are other flaws which, as I have mentioned, are worth having, but just now care should be taken not to throw money about on such things without due care. If you are only a beginner and still want to go in for varieties, try to get expert opinion which is able to separate the worthwhile from the other kind. I am sure that a collection which contains one or two nice varieties (this is why I am against printed albums, for they leave no room for one's individual taste) is all the better for their inclusion, but again, watch how you spend your cash.

And now a little puzzle to end with. Look at the Aden stamp, and see if you can guess where the error is? Answer next month.

Florida's Lost World—

(*Continued from page 336*)

merchantman which turned out to be a disguised American gunboat. His ship disabled, Gasparilla made good his boast that he would never be taken alive. He looped a chain around his body and leapt into the sea.

Several treasure-hunting expeditions have entered the swamp for this fabled hoard, all apparently without result. However, local fishermen still talk of finding the decayed remains of an old sea chest in the bottom of a drifting boat. This boat was discovered, abandoned, three months after it had been chartered in the summer of 1946, by three close-mouthed men heading for the swamp. The men were never seen again, and what they found is anyone's guess.

In the past, men came to the swamp in search of plunder, logging or treasure trove. Today, visitors travel there for a very different purpose. They come to gain a kind of contentment; to be refreshed and uplifted by standing deep in a primeval forest, close to wildlife in surroundings remote and isolated from the march of civilisation.

As long as Man values solitude, Corkscrew Swamp will continue to be Florida's lost world.

Easy Model-Building—(*Continued from page 347*)

their elongated holes.

Stepped Curved Strips 9 and 10 form the necks of the horses, the heads being two Fishplates overlapped and bolted in the end holes of each of the Stepped Curved Strips 9 and 10.

Parts required to build the Chariot: 1 of No. 2; 9 of No. 5; 5 of No. 10; 2 of No. 11; 7 of No. 12; 1 of No. 16; 2 of No. 22; 34 of No. 37a; 33 of No. 37b; 6 of No. 38; 2 of No. 48a; 4 of No. 90a; 2 of No. 125; 1 of No. 126a; 2 of No. 142c; 2 of No. 188; 1 of No. 190; 2 of No. 199; 2 of No. 200; 1 of No. 212; 1 of No. 214.

Space Notes—(*Continued from page 331*)

turbines or even gas jets can be used.

Another important function is at thrust cut-off. The speed at cut-off must be very accurately controlled but, unfortunately, it is extremely difficult to ensure that the main motors are switched off at exactly the right split second. It is, therefore, common practice to stop the main motors a little early and come up to final speed by means of the small control motors.

STILL UP

It is quite a task keeping in touch with the satellite position. Launchings are now so frequent that only a very heavy satellite or one with an unusual payload, such as the Tiros cloud-photographing satellite, receives more than a couple of lines in the newspapers. The table on page 331 gives brief details of satellites still in orbit at the time of writing. This list may easily double by the end of the year—NASA alone have another dozen launchings planned.

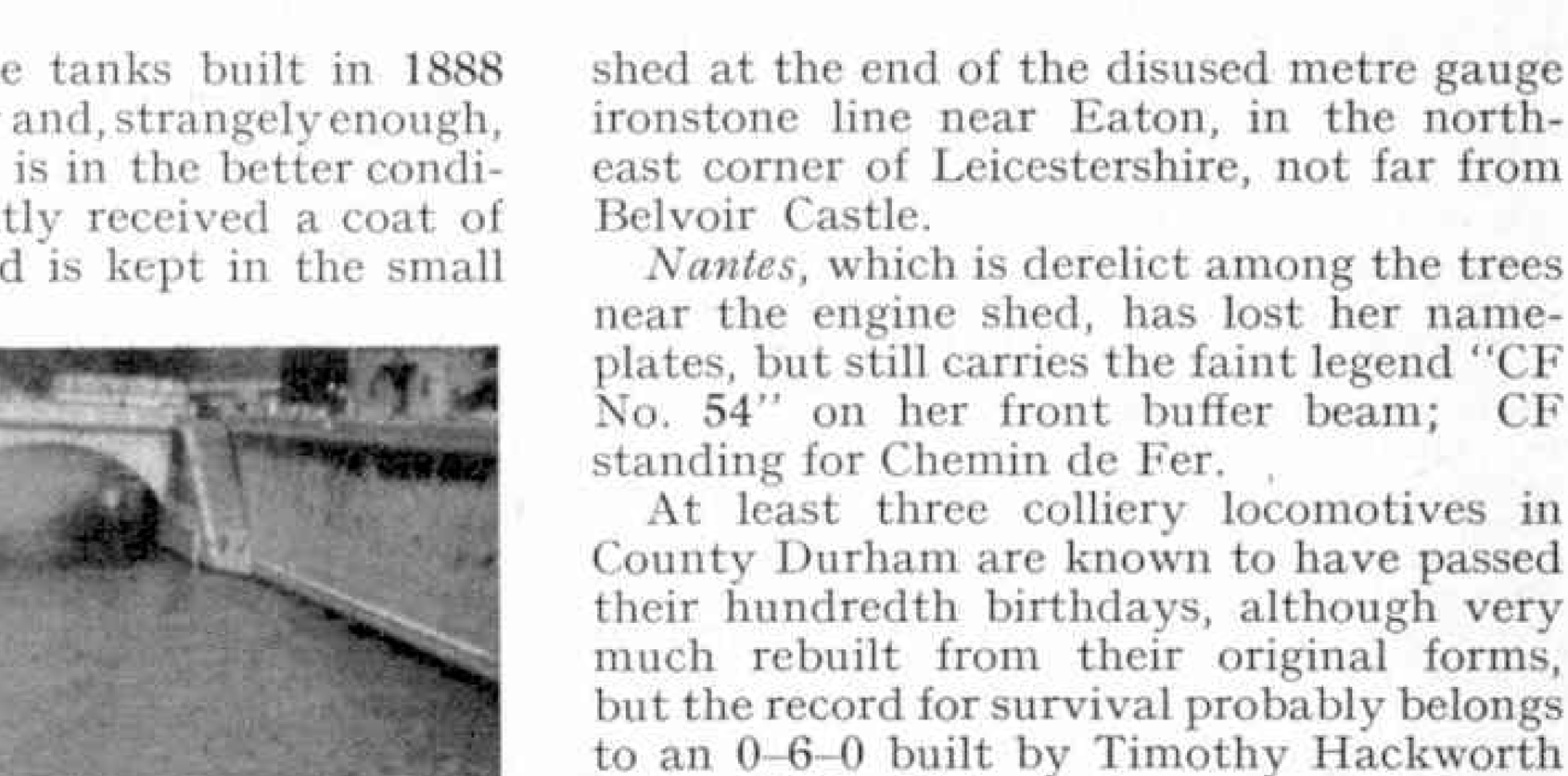
From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

Two French Veterans

Among the thousands of colliery and industrial locomotives in this country are many which are of great interest, including what are believed to be the only two examples of French locomotives now to be seen in the British Isles.

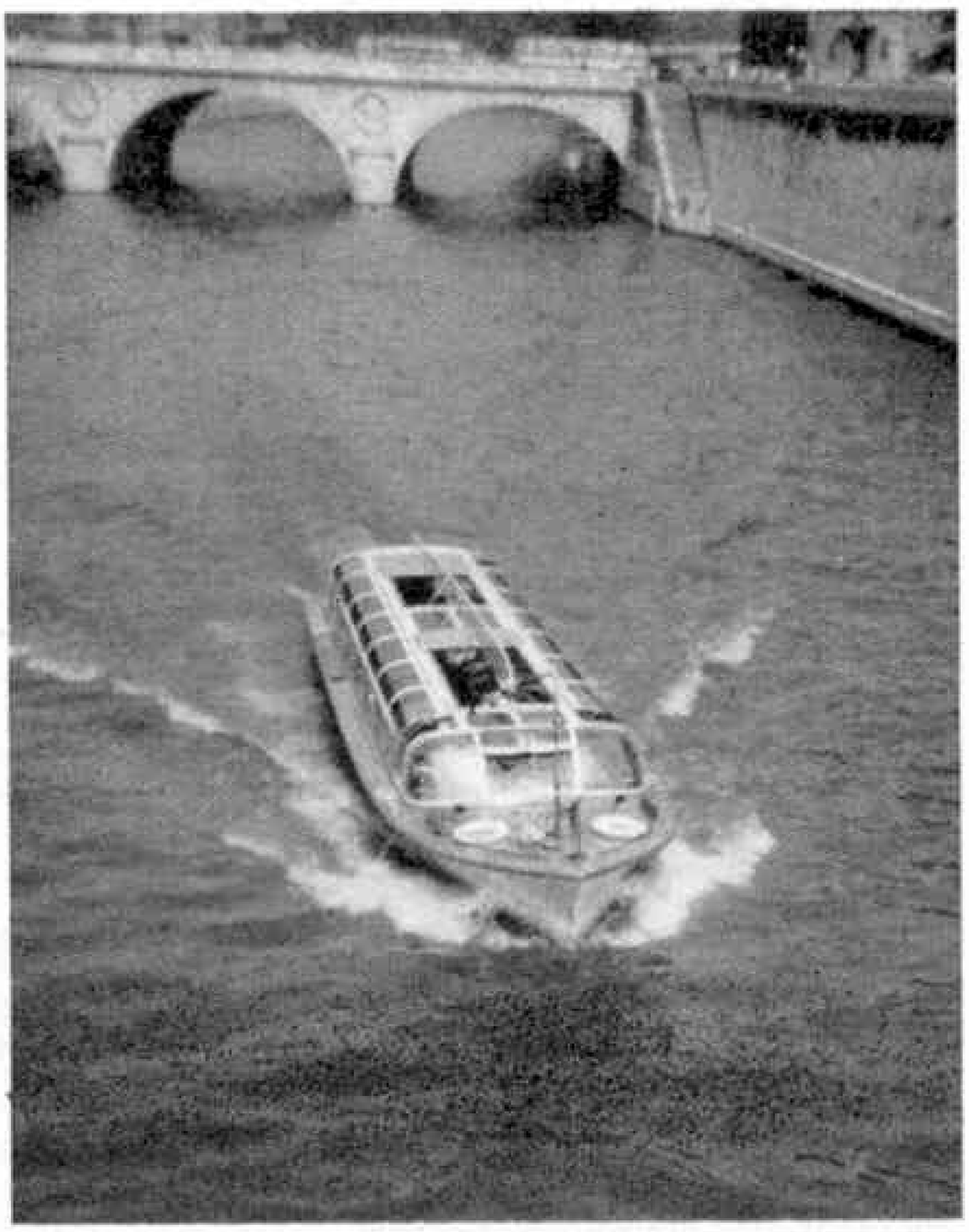
These are *Cambrai* and *Nantes*, 0–6–0 saddle tanks built in 1888 and 1903 respectively and, strangely enough, it is the older which is in the better condition. *Cambrai* recently received a coat of light green paint and is kept in the small shed at the end of the disused metre gauge ironstone line near Eaton, in the north-east corner of Leicestershire, not far from Belvoir Castle.



Nantes, which is derelict among the trees near the engine shed, has lost her name-plates, but still carries the faint legend "CF No. 54" on her front buffer beam; CF standing for Chemin de Fer.

At least three colliery locomotives in County Durham are known to have passed their hundredth birthdays, although very much rebuilt from their original forms, but the record for survival probably belongs to an 0–6–0 built by Timothy Hackworth in the 1830's. This specimen was withdrawn nearly 90 years ago but the boiler and wheels were still intact at South Hetton Colliery in 1950, and may well be there to this day.

P. J. LYNCH
(Bulwell Forest).



Visitors to Paris are often to be seen admiring the various craft which carry passengers along the River Seine. The photograph on the left, from M.M. reader N. E. Fairbrother, of Leeds, shows one of the trim vessels at speed near Notre Dame. It is a class of boat known as "Vedette de la Tour Eiffel" which sails, as its name implies, from the Eiffel Tower. An indicator board runs from bow to stern along the top of the boat.

"Can you locate my kite, please? The string broke!"

Fireside Fun

Junior: Are you an actress Auntie?
Aunt: Why, no. Why do you ask?
Junior: Well, Daddy said when you came we'd have a scene.

* * * *

"Any of you lads know anything about shorthand?" asked the sergeant of a bunch of recruits, whom he had found averse to manual work.

There was quick response and six men fell out at once.

"Okay. They are short-handed in the cookhouse—Quick march!" shouted the sergeant.

* * * *

Teacher: What excuse have you for being late?
Johnny (breathlessly): I ran so fast, teacher, that I didn't have time to think of one.

* * * *

"No, Bobby, you cannot have the hammer to play with; you will hurt your fingers."
Bobby: "No, I shan't. Joan is going the hold the nails."

* * * *

Addressing the class, the professor said, "The slightest degree of error in this experiment and we are all liable to be blown through the roof. Now kindly come a little closer so that you will be able to follow me better."

* * * *

Junior rushed into the house.
"Dad, I've been in a fight." he panted. "Who won?" asked his father.
"I don't know—I left in the middle," said the boy.

A road-hog, who would never let another car overtake him if he could help it, was driving at great speed one day when he heard an insistent honking behind him.

He turned and saw, just on his heels, a baby car. He pressed down the accelerator and up shot the speedometer. He touched seventy-eight, but still the honking continued frantically.

Worn out, the speed-maniac slowed down and drew in to the side of the road, and shouted: "Come on, then, if you must pass."

"I can't!" called back the driver of the baby-car. "I'm hooked on."

* * * *

A pawnbroker loaded his window with unredeemed saxophones, banjos, tubas—and shotguns.

"Very interesting display," commented a friend, "but does it sell merchandise?"

"Does it?" enthused the pawnbroker. "One day a fellow buys a sax or a tuba and two days later his neighbours buy the shotguns."

* * * *

BRAIN TEASER

A puzzle with Matches.

Take six matches and with them make a six-sided figure as shown below. Now take three more matches and see if you can add them to the six already laid out in such a manner as to make *another* six-sided figure.

* * * *

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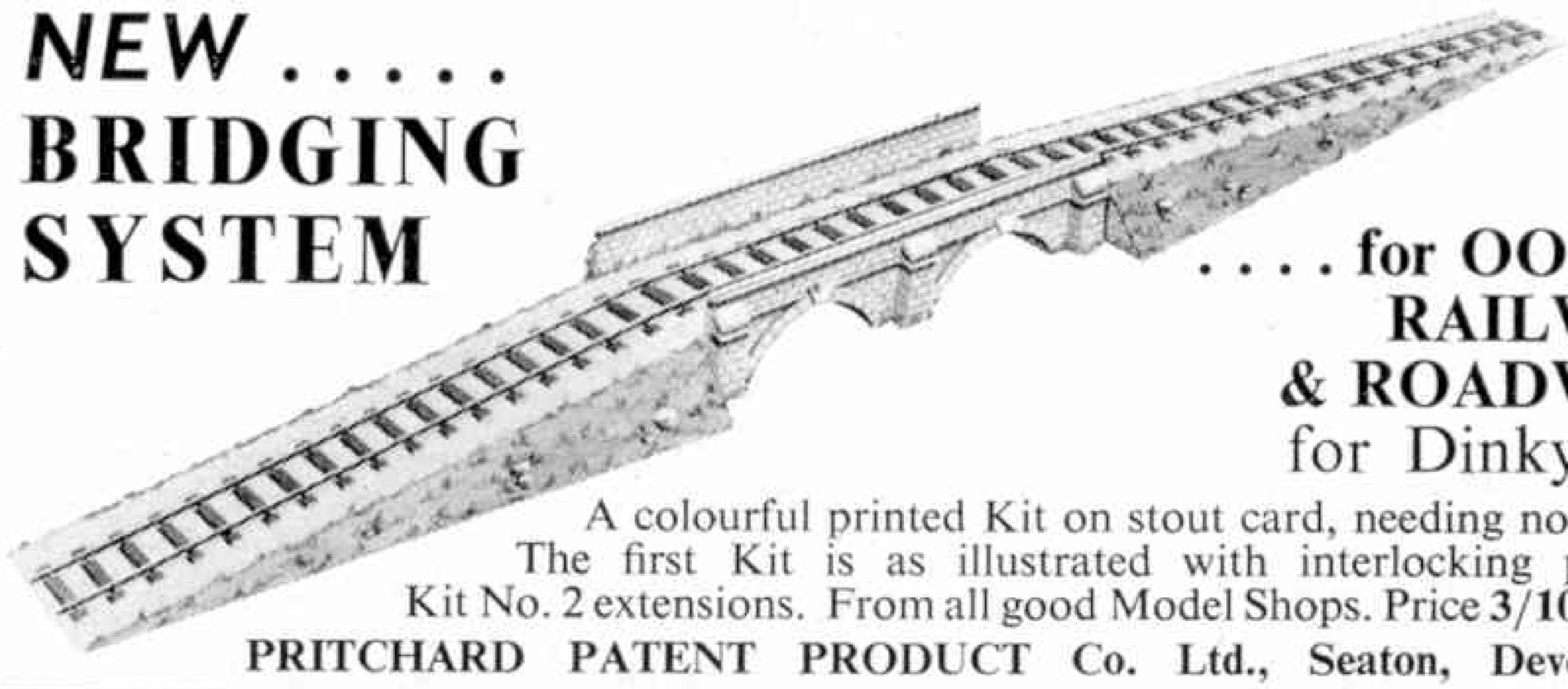

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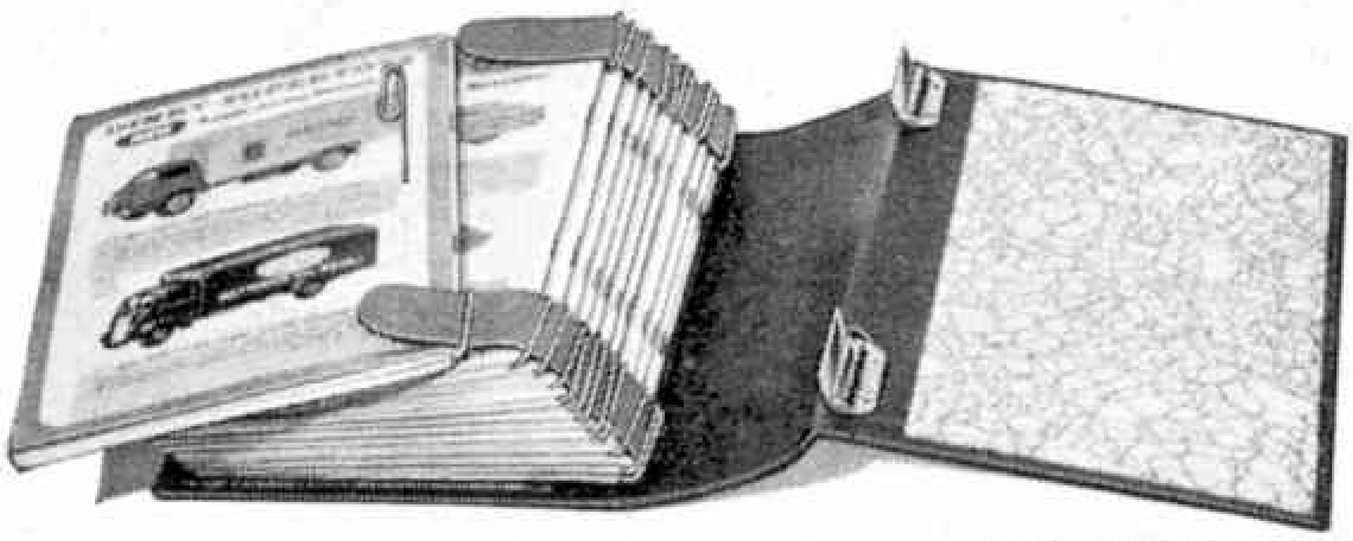

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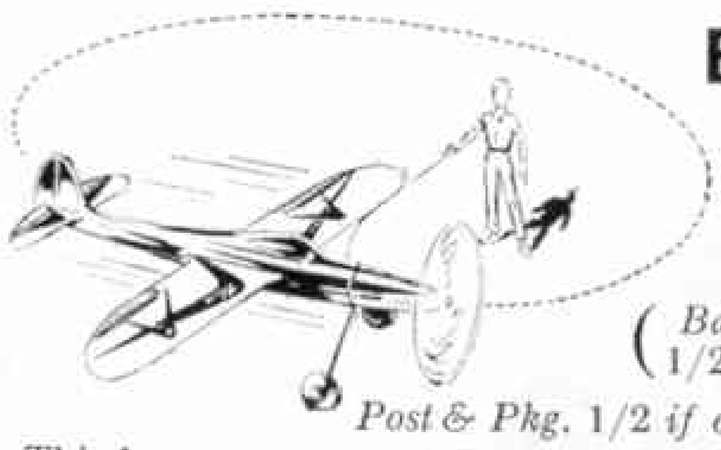

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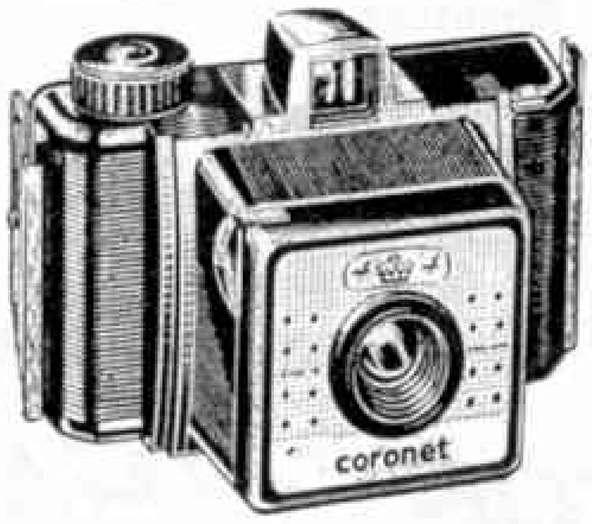

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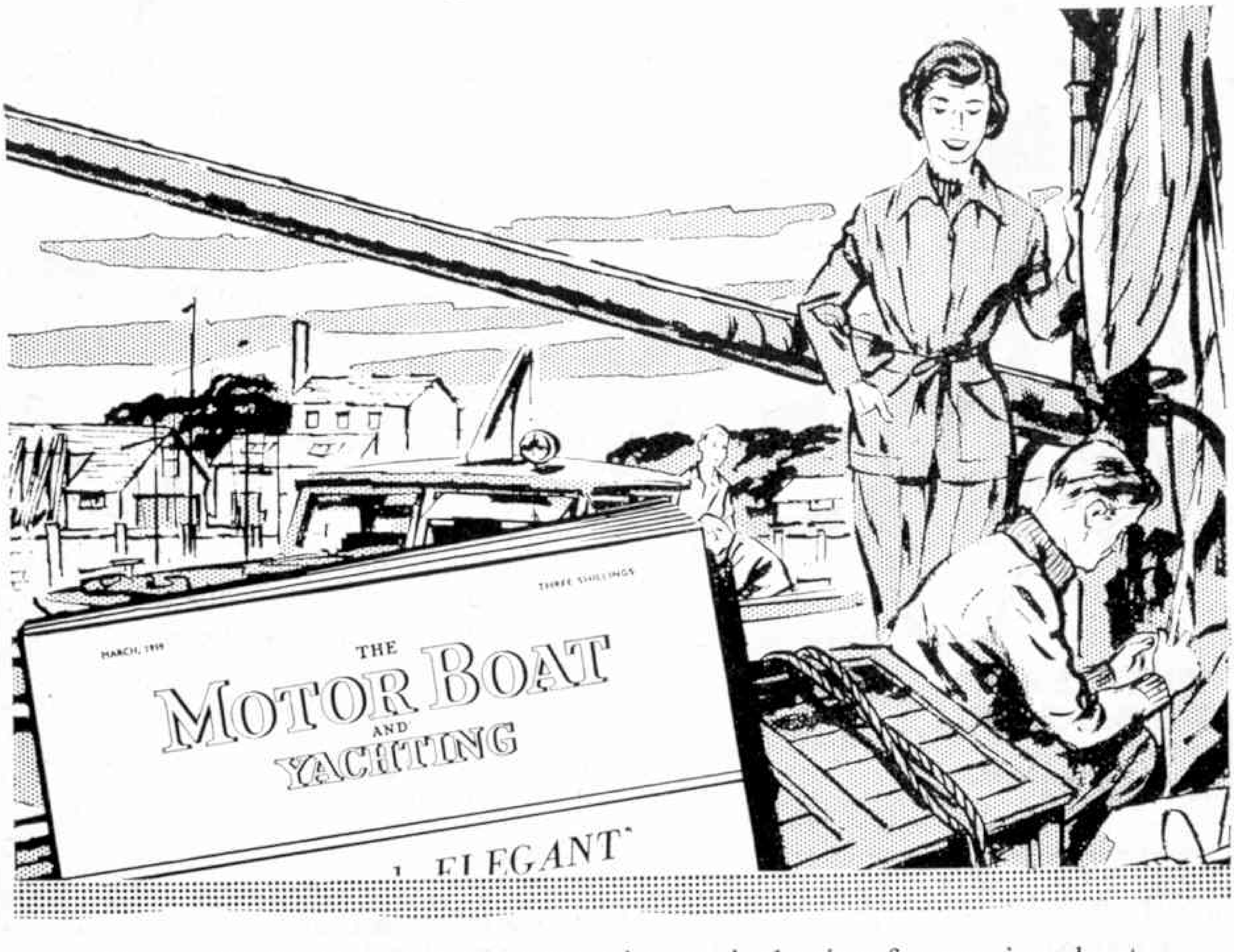

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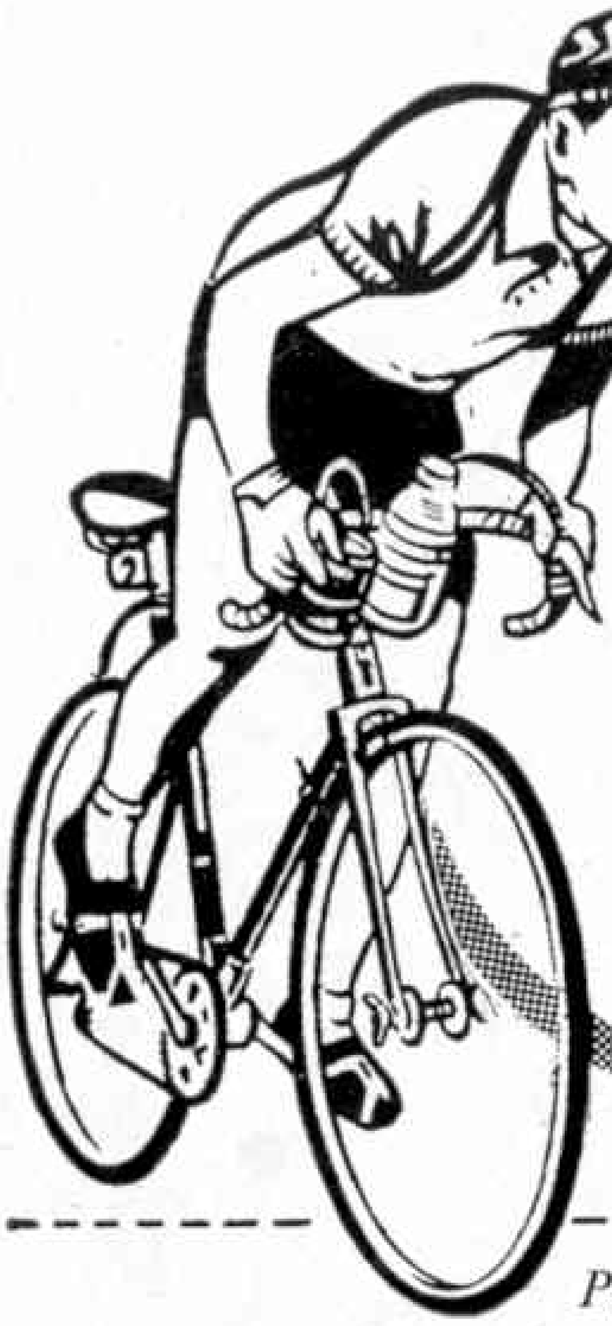

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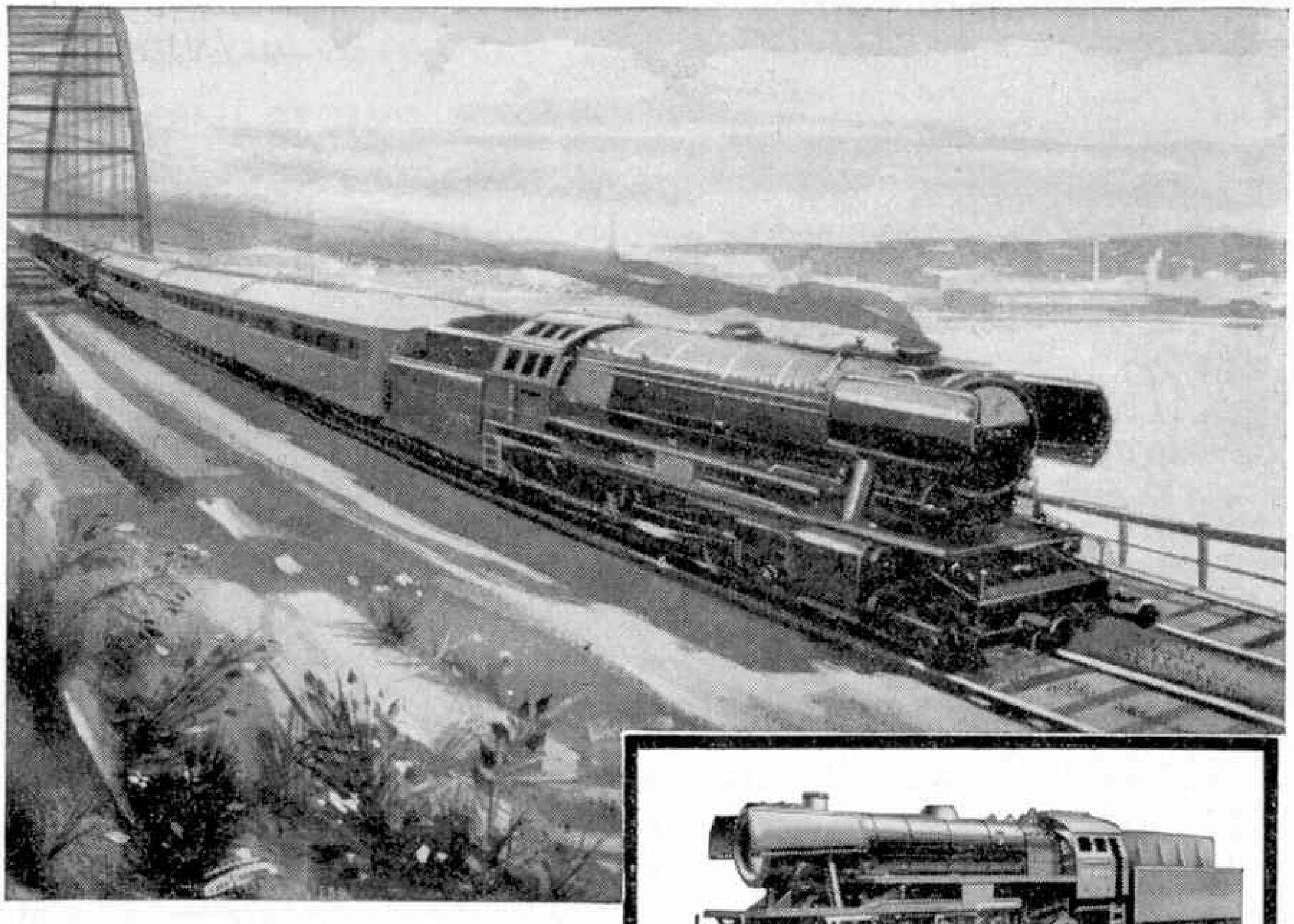

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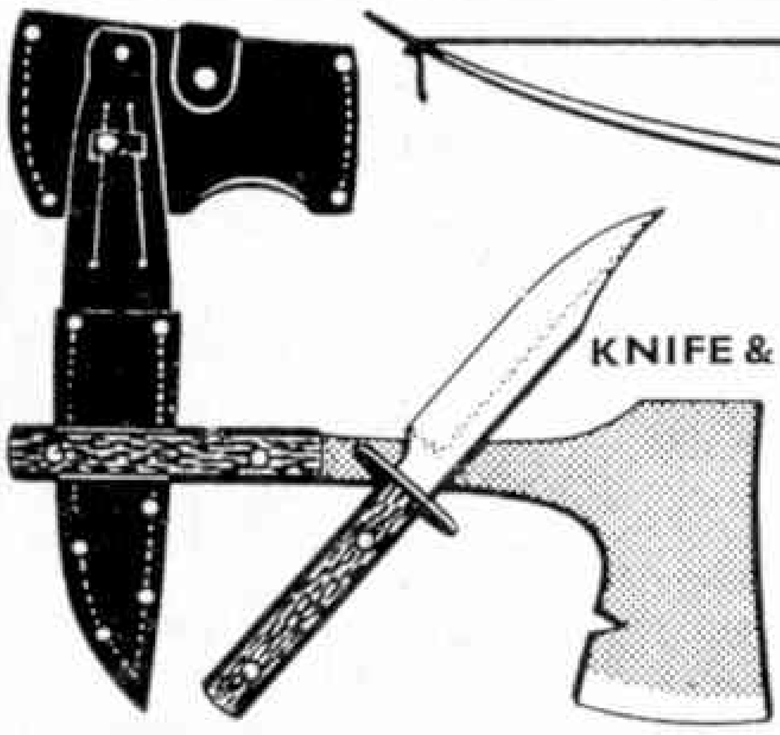

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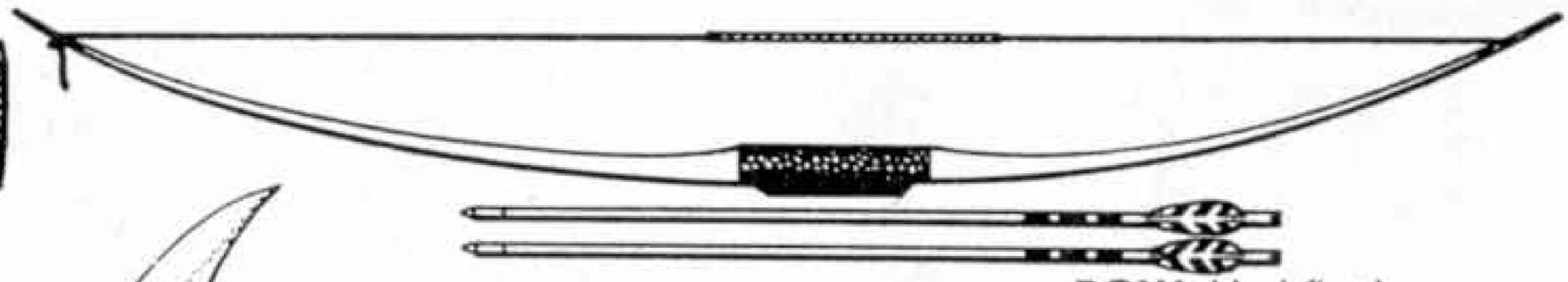

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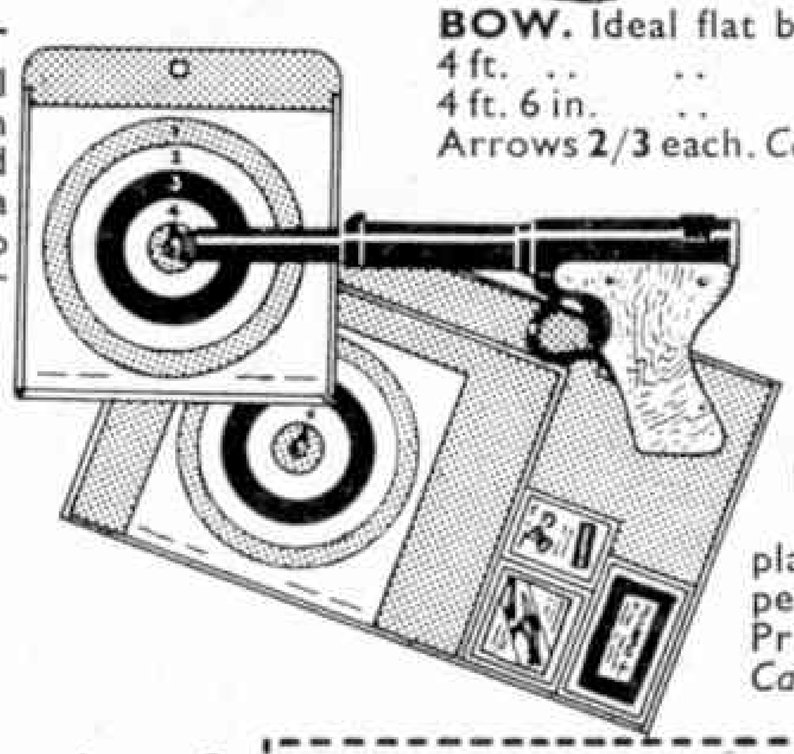

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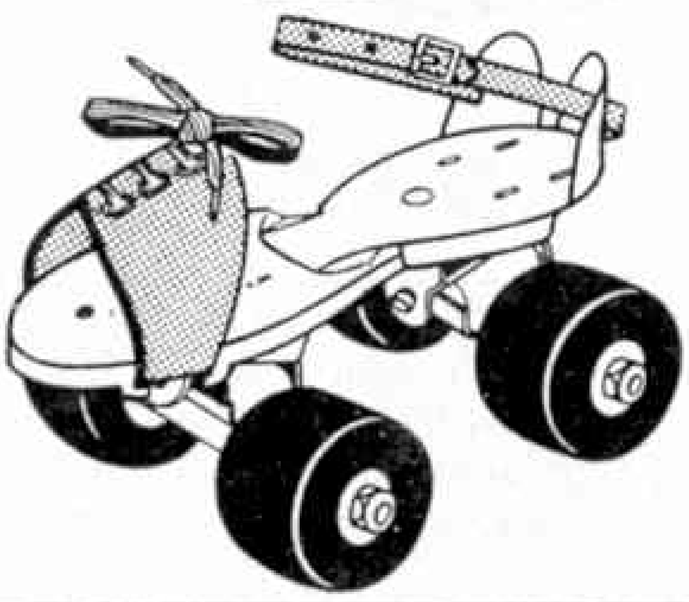

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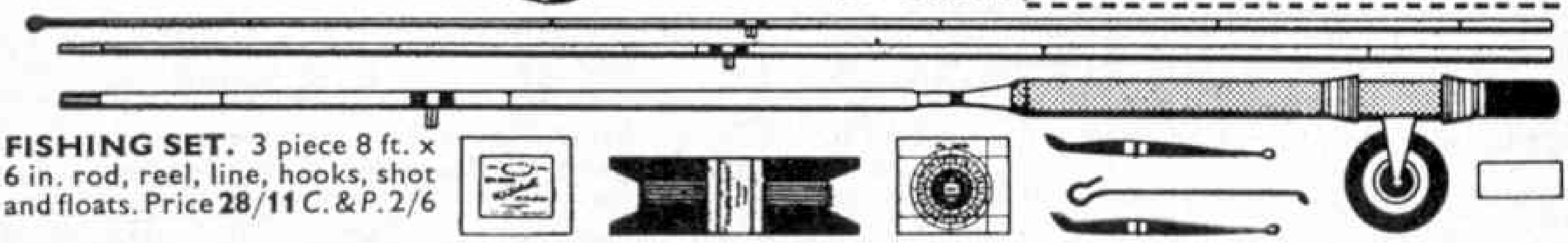

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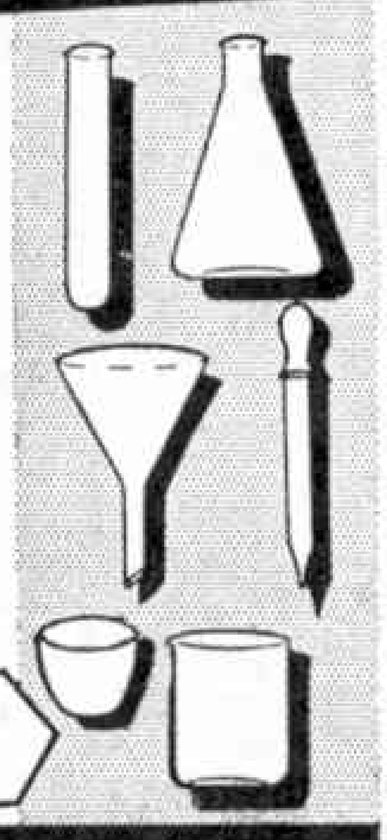

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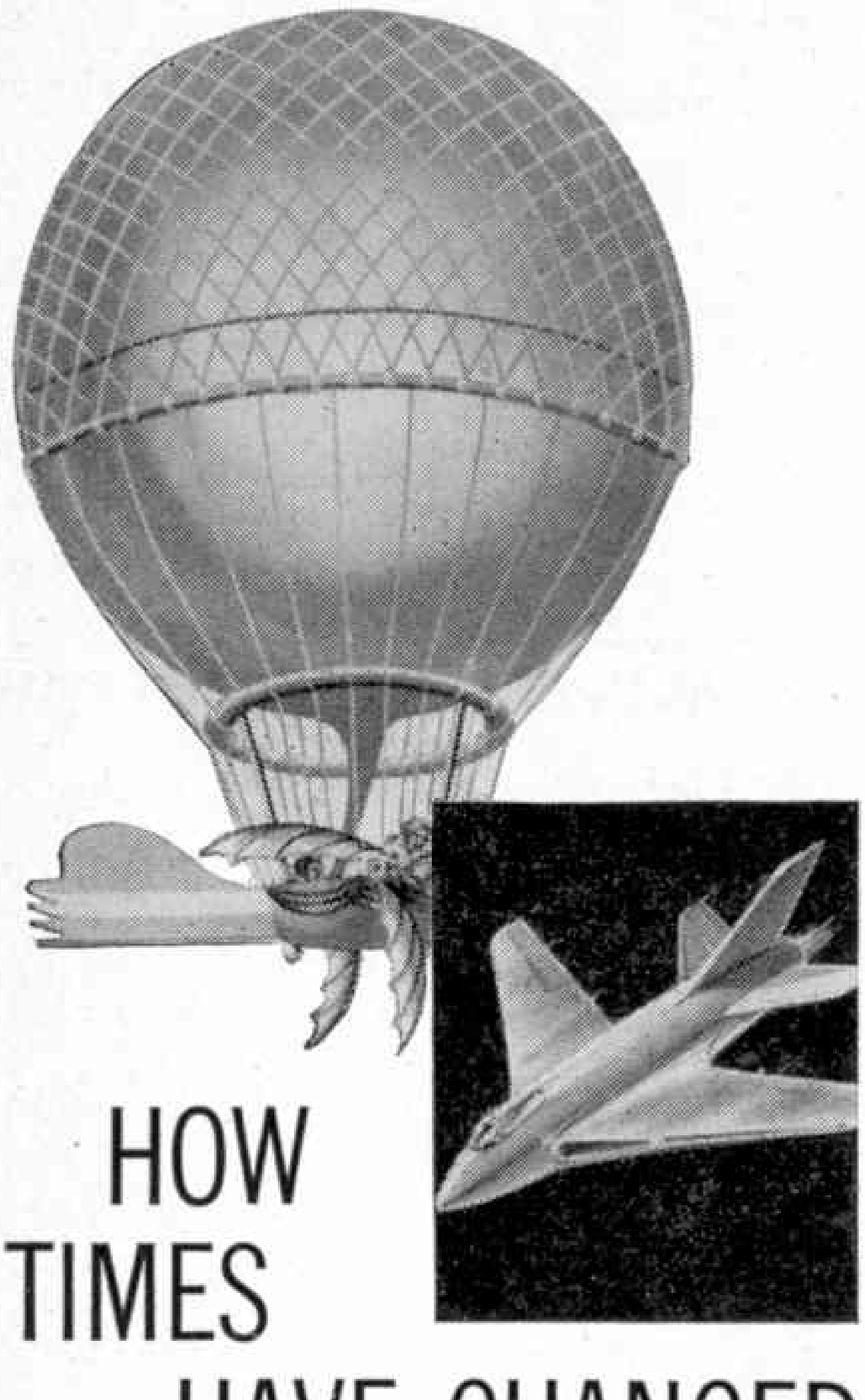

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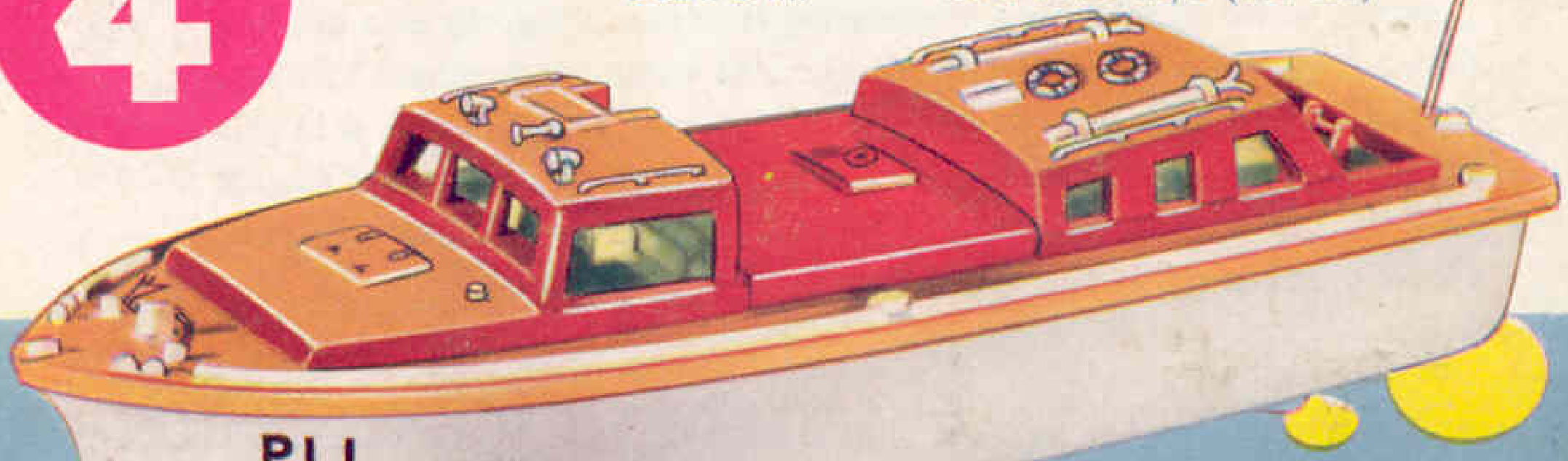

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